ML-170
Installation/Operator's Manual

WARNING: For your safety the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death.

—Do not store or use gasoline or other flammable vapor and liquids in the vicinity of this or any other appliance.

—WHAT DO YOU DO IF YOU SMELL GAS

* Do not try to light any appliance.
* Do not touch any electrical switch; do not use any phone in your building.
* Clear the room, building or area of all occupants.
* Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
* If you cannot reach your gas supplier, call the fire department.

—Installation and service must be performed by a qualified installer, service agency or the gas supplier.

AVERTISSEMENT: Assurez-vous de bien suivre les instructions données dans cette notice pour réduire au minimum le risque d'incendie ou d'explosion ou pour éviter tout dommage matériel, toute blessure ou la mort.

—Ne pas entreposer ni utiliser d'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil ou de tout autre appareil.

—QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:

* Ne pas tenter d'allumer d'appareil.
* Ne touchez à aucun interrupteur. Ne pas vous servir des téléphones se trouvant dans le bâtiment où vous vous trouvez..
* Évacuez la pièce, le bâtiment ou la zone.
* Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
* Si vous ne pouvez rejoindre le fournisseur de gaz, appelez le service des incendies.

—L'installation et l'entretien doivent être assurés par un installateur ou un service d'entretien qualifié ou par le fournisseur de gaz.

American Dryer Corp.

For replacement parts, contact the distributor from which the dryer was purchased or
American Dryer Corporation
88 Currant Road
Fall River MA 02720-4781
Telephone: (508) 678-9000 / Fax: (508) 678-9447
E-mail: techsupport@amdry.com

080197GS/abe

ADC Part No. 113003

Retain This Manual In A Safe Place For Future Reference

American Dryer Corporation products embody advanced concepts in engineering, design, and safety. If this product is properly maintained, it will provide many years of safe, efficient, and trouble-free operation.

ONLY qualified technicians should service this equipment.

OBSERVE ALL SAFETY PRECAUTIONS displayed on the equipment or specified in the installation/operator's manual included with the dryer.

The following **"FOR YOUR SAFETY"** caution **must be** posted near the dryer in a prominent location.

FOR YOUR SAFETY	POUR VOTRE SÉCURITÉ
Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.	Ne pas entreposer ni utiliser d'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil ou de yout autre appareil.

We have tried to make this manual as complete as possible and hope you will find it useful. **ADC** reserves the right to make changes from time to time, without notice or obligation, in prices, specifications, colors, and material, and to change or discontinue models.

Important

For your convenience, log the following information:

DATE OF PURCHASE _____ **MODEL NO.** **ML-170**

DISTRIBUTORS NAME _____

Serial Number(s) _____

_____

_____

Replacement parts can be obtained from your distributor or the **ADC** factory. When ordering replacement parts from the factory, you can FAX your order to **ADC** at (508) 678-9447 or telephone your orders directly to the **ADC** Parts Department at (508) 678-9000. Please specify the dryer **model number** and **serial number** in addition to the **description** and **part number**, so that your order is processed accurately and promptly.

The illustrations on the following pages may not depict your particular dryer exactly. The illustrations are a composite of the various dryer models. Be sure to check the descriptions of the parts thoroughly before ordering.

"IMPORTANT NOTE TO PURCHASER"

Information must be obtained from your local gas supplier on the instructions to be followed if the user smells gas. These instructions must be posted in a prominent location near the dryer.

IMPORTANT

YOU MUST DISCONNECT and LOCKOUT THE ELECTRIC SUPPLY and THE GAS SUPPLY or THE STEAM SUPPLY BEFORE ANY COVERS or GUARDS ARE REMOVED FROM THE MACHINE TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, or TESTING OF ANY EQUIPMENT per OSHA (Occupational Safety and Health Administration) **STANDARDS.**

"Caution: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper operation."

«Attention: Lor des opérations d'entretien des commandes étiqueter tous fils avant de les déconnecter. Toute erreur de câblage peut étre une source de danger et de panne.»

CAUTION

DRYER(S) SHOULD NEVER BE LEFT UNATTENDED WHILE IN OPERATION.

WARNING

CHILDREN SHOULD NOT BE ALLOWED TO PLAY ON OR NEAR THE DRYER(S).

CHILDREN SHOULD BE SUPERVISED IF NEAR DRYER(S) IN OPERATION.

FOR YOUR SAFETY

DO NOT DRY MOP HEADS IN THE DRYER.

DO NOT USE DRYER IN THE PRESENCE OF DRY CLEANING FUMES.

WARNING

UNDER NO CIRCUMSTANCES should the door switch or the heat circuit devices ever be disabled.

WARNING

The dryer must never be operated with any of the back guards, outer tops, or service panels removed. PERSONAL INJURY or FIRE COULD RESULT.

WARNING

DRYER MUST NEVER BE OPERATED WITHOUT THE LINT FILTER/SCREEN IN PLACE...EVEN IF AN EXTERNAL LINT COLLECTION SYSTEM IS USED.

IMPORTANT

PLEASE OBSERVE ALL SAFETY PRECAUTIONS displayed on the equipment and/or specified in the installation/operator's manual included with the dryer.

Dryer(s) **must not** be installed or stored in an area where it will be exposed to water and/or weather.

The wiring diagram for the dryer is located in the front electrical control box area.

Table of Contents

SECTION I
IMPORTANT INFORMATION

A. Receiving and Handling 3
B. Safety Precautions 4

SECTION II
SPECIFICATIONS/COMPONENT IDENTIFICATION

A. Specifications 6
B. Component Identification 8

SECTION III
INSTALLATION PROCEDURES

A. Location Requirements 10
B. Unpacking/Setting Up 11
C. Dryer Enclosure Requirements 13
D. Fresh Air Supply Requirements 14
E. Exhaust Requirements 15
F. Electrical Information 21
G. Gas Information 25
H. Steam Information 29
I. Preparation For Operation/Start-Up 33
J. Preoperational Tests 34
K. Compressed Air Requirements 37
L. Shut Down Instructions 38

SECTION IV
SERVICE/PARTS INFORMATION

A. Service 39
B. Parts 39

SECTION V
WARRANTY INFORMATION

A. Returning Warranty Card(s) 40
B. Parts 40
C. Returning Warranty Card(s) 40

SECTION VI
ROUTINE MAINTENANCE
A. Cleaning 42
B. Adjustments 44
C. Lubrication 44

SECTION VII
REVERSING TIMER SPIN/DWELL ADJUSTMENTS 45

SECTION VIII
DATA LABEL LOCATION/INFORMATION 46

SECTION IX
PROCEDURE FOR FUNCTIONAL CHECK OF REPLACEMENT COMPONENTS 48

SECTION I

IMPORTANT INFORMATION

A. RECEIVING and HANDLING

The dryer is shipped in a protective stretch wrap cover with protective cardboard corners and top cover (or optional box) as a means of preventing damage in transit. Upon delivery, the dryer and/or packaging, and wooden skid ***should be*** visually inspected for shipping damage. If any damage whatsoever is noticed, inspect further before delivering carrier leaves.

Dryers damaged in shipment:

1. ***ALL*** dryers ***should be*** inspected upon receipt and before they are signed for.

2. If there is suspected damage or actual damage, the trucker's receipt ***should be*** so noted.

3. If the dryer is damaged beyond repair, it ***should be*** refused. Those dryers which were not damaged in a damaged shipment ***should be*** accepted, but the number received and the number refused ***must be*** noted on the receipt.

4. If you determine that the dryer was damaged after the trucker has left your location, you should call the delivering carrier's freight terminal immediately and file a claim. The freight company considers this concealed damage. This type of freight claim is very difficult to get paid and becomes extremely difficult when more than a day or two passes after the freight was delivered. It is your responsibility to file freight claims. Dryer/parts damaged in transit ***cannot*** be claimed under warranty.

5. Freight claims are the responsibility of the consignee, and ***ALL*** claims ***must be*** filed at the receiving end. **ADC** assumes no responsibility for freight claims or damages.

6. If you need assistance in handling the situation, please contact the **ADC** Traffic Manager at (508) 678-9000.

IMPORTANT: The dryer ***must be*** transported and handled in an upright position at *all* times.

B. SAFETY PRECAUTIONS

WARNING: For your safety, the information in this manual ***must be*** followed to minimize the risk of fire or explosion or to prevent property damage, personal injury, or loss of life.

WARNING: The dryer must never be operated with any of the back guards, outer tops, or service panels removed. PERSONAL INJURY or FIRE COULD RESULT.

1. ***DO NOT*** store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

2. Purchaser/user should consult the local gas supplier for proper instructions to be followed in the event the user smells gas. The instructions ***should be*** posted in a prominent location.

3. WHAT TO DO IF YOU SMELL GAS...

   a. ***DO NOT*** try to light any appliance.

   b. ***DO NOT*** touch any electrical switch.

   c. ***DO NOT*** use any phone in your building.

   d. Clear the room, building, or area of ***ALL*** occupants.

   e. ***Immediately*** call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.

   f. If you ***cannot*** reach your gas supplier, call the fire department.

4. Installation and service ***must be*** performed by a qualified installer, service agency, or gas supplier.

5. Dryer(s) ***must be*** exhausted to the outdoors.

6. Although **ADC** produces a very versatile machine, there are some articles that, due to fabric composition or cleaning method, ***should not*** be dried in it.

WARNING: Dry only water-washed fabrics. ***DO NOT*** dry articles spotted or washed in dry cleaning solvents, a combustible detergent, or "all purpose" cleaner. ***EXPLOSION COULD RESULT.***

WARNING: ***DO NOT*** dry rags or articles coated or contaminated with gasoline, kerosene, oil, paint, or wax. ***EXPLOSION COULD RESULT.***

WARNING: ***DO NOT*** dry mop heads. Contamination by wax or flammable solvent will create a fire hazard.

WARNING: ***DO NOT*** use heat for drying articles that contain plastic, foam, sponge rubber, or similarly textured rubberlike materials. Drying in a heated basket (tumbler) may damage plastics or rubber and also may be a fire hazard.

7. A program ***should be*** established for the inspection and cleaning of lint in the burner area, exhaust duct work, and area around the back of the dryer. The frequency of inspection and cleaning can best be determined from experience at each location.

WARNING: The collection of lint in the burner area and exhaust duct work can create a potential fire hazard.

8. For personal safety, the dryer ***must be*** electrically grounded in accordance with local codes and/or the NATIONAL ELECTRIC CODE ANSI/NFPA NO. 70-LATEST EDITION.

NOTE: Failure to do so will VOID THE WARRANTY.

9. ***UNDER NO CIRCUMSTANCES*** should the dryer door switches, the lint drawer switch, or the heat safety circuit ever be disabled.

WARNING: PERSONAL INJURY or FIRE COULD RESULT.

10. This dryer ***is not*** to be used in the presence of dry cleaning solvents or fumes.

11. Remove articles from the dryer as soon as the drying cycle has been completed.

WARNING: Articles left in the dryer after the drying and cooling cycles have been complete can create a fire hazard.

12. ***DO NOT*** operate steam dryers with more than 125 PSI steam pressure. Excessive steam pressure can damage the steam coil and/or harm personel.

13. Replace leaking flexible steam hoses or other fixtures immediately. ***DO NOT*** operate the dryer with leaking flexible hoses. **PERSONAL INJURY MAY RESULT.**

14. **READ and FOLLOW *ALL* CAUTION and DIRECTION LABELS ATTACHED TO THE DRYER.**

WARNING: YOU MUST DISCONNECT and LOCKOUT THE ELECTRIC SUPPLY and THE GAS SUPPLY or THE STEAM SUPPLY BEFORE ANY COVERS or GUARDS ARE REMOVED FROM THE MACHINE TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, or TESTING OF ANY EQUIPMENT per OSHA (Occupational Safety and Health Administration) **STANDARDS.**

SECTION II

SPECIFICATIONS/COMPONENT IDENTIFICATION

A. SPECIFICATIONS

Maximum Capacity (dry weight)			170 lbs.		77.1 kg
Basket (tumbler) Diameter			51-1/2"		130.8 cm
Basket (tumbler) Depth			42-1/2"		107.9 cm
Drive Motor			1 HP		.746 kw
Blower Motor			7-1/2 HP		5.6 kw
Door Opening (diameter)			31-3/8"		79.7 cm
Basket (tumbler) Volume			51.2 cu. ft.		1.45 cu.m.
Dryers Per 20'/40' Container			3/7		
Dryers Per 45'/48' Truck			8/8		
Gas	Voltage Available		208-600v / 3ø / 3, 4w / 50/60Hz		
	Approx. Weight (uncrated)		1,900 lbs.		861.8 kg
	Approx. Weight (crated)		2,066 lbs.		937.1 kg
	Heat Input		550,000 btu/hr		138,600 kcal/hr
	Airflow		3,700 cfm		283 cmm
	Inlet Pipe Size		1-1/2" F.P.T.		5.08 cm
	Compressed Air Volume		2.5 cfh @ 80 PSI		.007 cmm
	Compressed Air Connection		1/8" N.P.T.		.318 cm
Steam	Voltage Available		208-600v / 3ø / 3, 4w / 50/60Hz		
	Approx. Weight (uncrated)		2,053 lbs		931.2 kg
	Approx. Weight (crated)		2,220 lbs.		1,007 kg
	Airflow		4,400 cfm		124.6 cmm
	Compressed Air Volume		6 cfh @ 80 PSI		.071 cmm
	Compressed Air Connection		1/8" N.P.T.		.318 cm
	Steam Comsumption		Boiler HP Normal Load		
	725 lbs/hr	329.1 kg/hr	19		
	Operating Steam Pressure		Steam Supply		Steam Return	
	125 psi max	8.6 bar	1-1/2"	3.81 cm	1-1/2"	3.81 cm

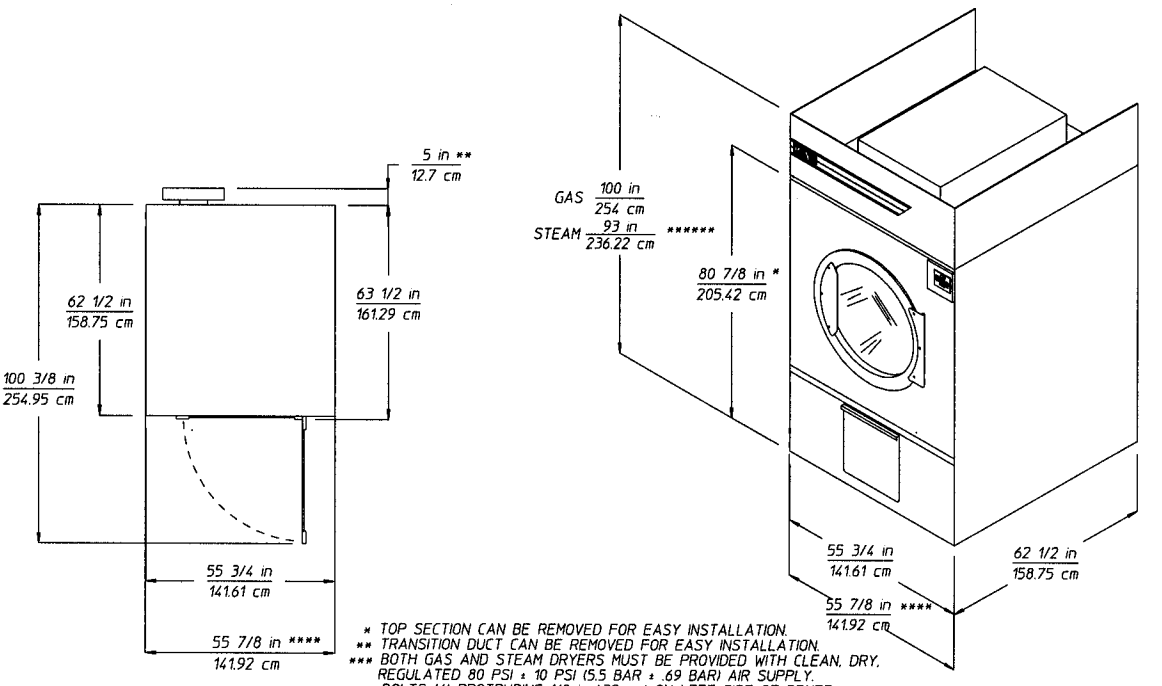
Shaded areas are stated in metric equivalents.

IMPORTANT: Gas Dryers and Steam Dryers ***must be*** provided with a clean, dry, regulated 80 PSI (+/- 10 PSI) air supply.

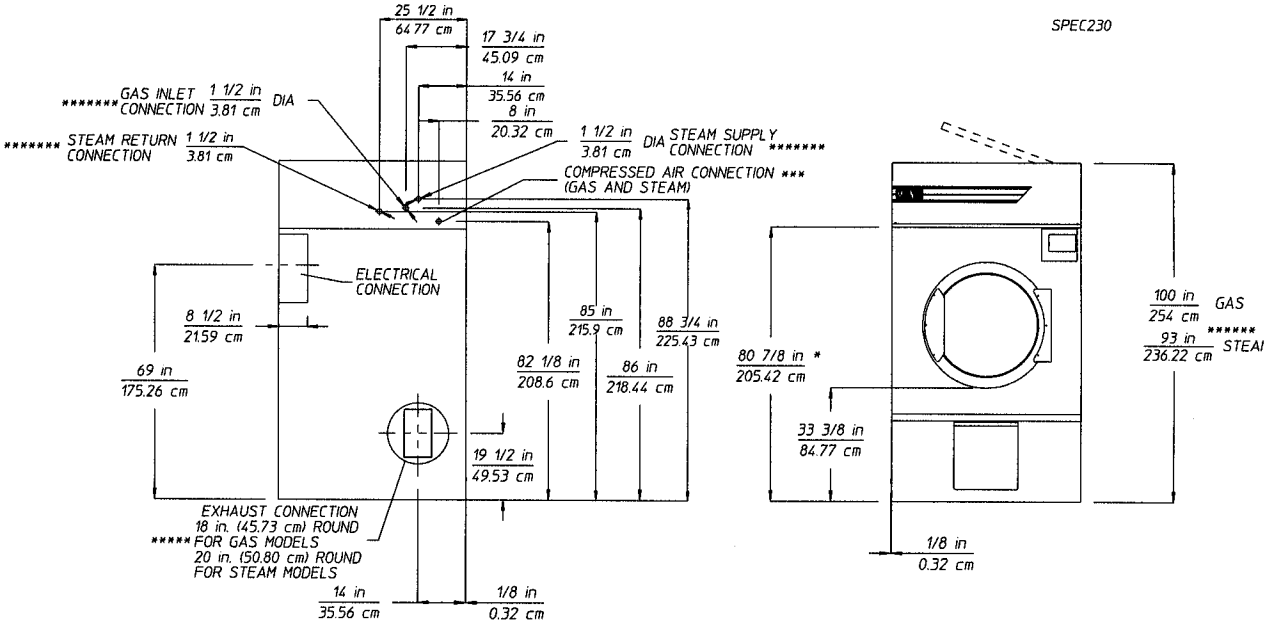
NOTE: **ADC** reserves the right to make changes in specifications at any time, without notice or obligation.

Specifications

MLG-170 (Gas)
MLE-170 (Electric
MLS-170 (Steam)



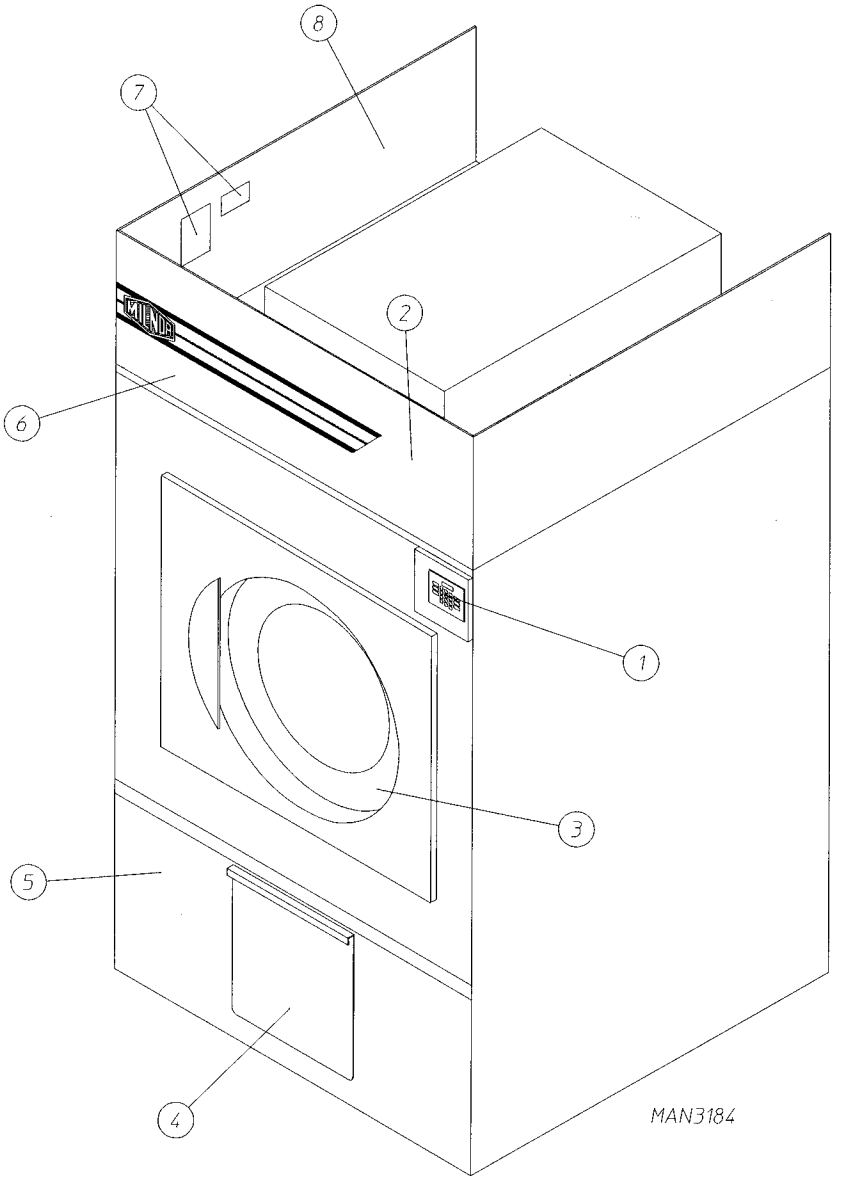
* TOP SECTION CAN BE REMOVED FOR EASY INSTALLATION.
** TRANSITION DUCT CAN BE REMOVED FOR EASY INSTALLATION.
*** BOTH GAS AND STEAM DRYERS MUST BE PROVIDED WITH CLEAN, DRY, REGULATED 80 PSI ± 10 PSI (5.5 BAR ± .69 BAR) AIR SUPPLY.
**** BOLTS (4) PROTRUDING 1/8 in (.32 cm) ON LEFT SIDE OF DRYER.
***** DUCT WORK MUST BE A MINIMUM OF 18 in DIA. (45.72 cm) FOR GAS MODELS AND 20 in DIA (50.8 cm) FOR STEAM MODELS. DUCT WORK SIZE VARIES WITH INSTALLATION CONDITIONS.
****** OPERATING HEIGHT OF STEAM DRYER IS 101 in (256.54 cm).
******* SIZE OF PIPING TO DRYER VARIES WITH INSTALLATION CONDITIONS. CONTACT FACTORY FOR ASSISTANCE.



NOTE: **ADC** reserves the right to make changes in specifications at any time, without notice or obligation.

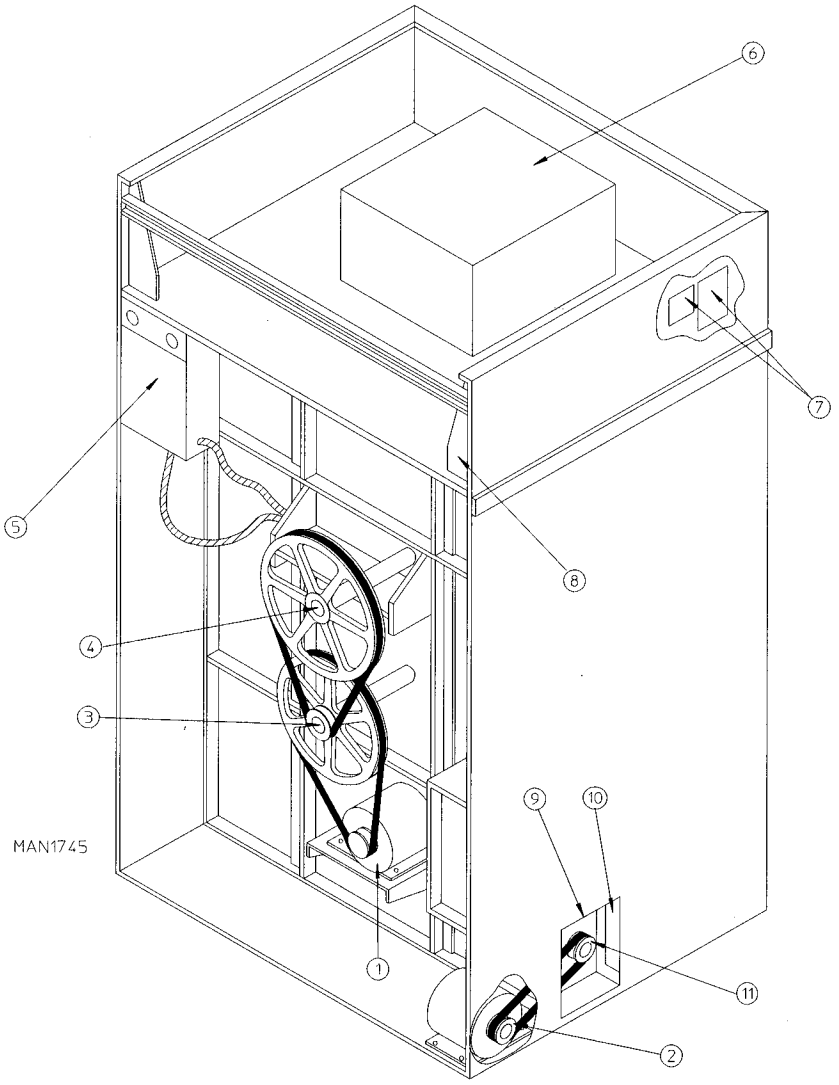
B. COMPONENT IDENTIFICATION

1. DRYER FRONT VIEW



Illus. No.	Description
1	Microprocessor Control/Keyboard Panel Assembly (Controls)
2	Control (Top Access) Door Assembly
3	Main Door Assembly
4	Lint Drawer
5	Lint Door
6	Wire Diagram (located behind Control Door)
7	Data Label and Installation Label
8	Top Console (Module) Assembly

2. DRYER REAR VIEW



REAR VIEW

Illus. No.	Description
1	Basket (drive) Motor Assembly
2	Blower Motor Mount Assembly
3	Idler Bearing Mount Assembly
4	Tumbler Bearing Mount Assembly
5*	Electric Service Relay Box
6	Heating Unit
7	Data Label and Installation Label
8	1/8" Compressed Air Supply Inlet (behind gusset)
9	Side Access Opening
10	Front Access Opening
11	Impellor (fan) Assembly

* Electric service connections are made in this box.

SECTION III

INSTALLATION PROCEDURES

Installation **should be** performed by competent technicians in accordance with local and state codes. In the absence of these codes, the installation **must conform** to applicable AMERICAN NATIONAL STANDARDS: National Fuel Gas Code ANSI.Z223.1-LATEST EDITION and/or National Electric Code ANSI/NFPA NO. 70-LATEST EDITION.

A. LOCATION REQUIREMENTS

Before installing the dryer, be sure the location conforms to local codes and ordinances. In the absence of such codes or ordinances the location **must conform** with the National Fuel Gas Code ANSI.Z223.1-LATEST EDITION.

1. The dryer **must be** installed on a sound level floor capable of supporting its weight. It is recommended that carpeting be removed from the floor area that the dryer is to rest on.

2. The dryer **must not** be installed or stored in an area where it will be exposed to water and/or weather.

3. The dryer is for use in noncombustible locations.

4. Provisions for adequate air supply **must be** provided as noted in this manual (refer to **Fresh Air Supply** in **Section D**).

5. Clearance provisions **must be** made from combustible construction as noted in this manual (refer to **Dryer Enclosure Requirements** in **Section C**).

6. Provisions **must be** made for adequate clearances for servicing and for operation as noted in this manual (refer to **Dryer Enclosure Requirements** in **Section C**).

7. Dryer **must be** exhausted to the outdoors (refer to **Exhaust Requirements** in **Section E**).

8. Dryer **must be** located in an area where correct exhaust venting can be achieved as noted in the manual (refer to **Exhaust Requirements** in **Section E**).

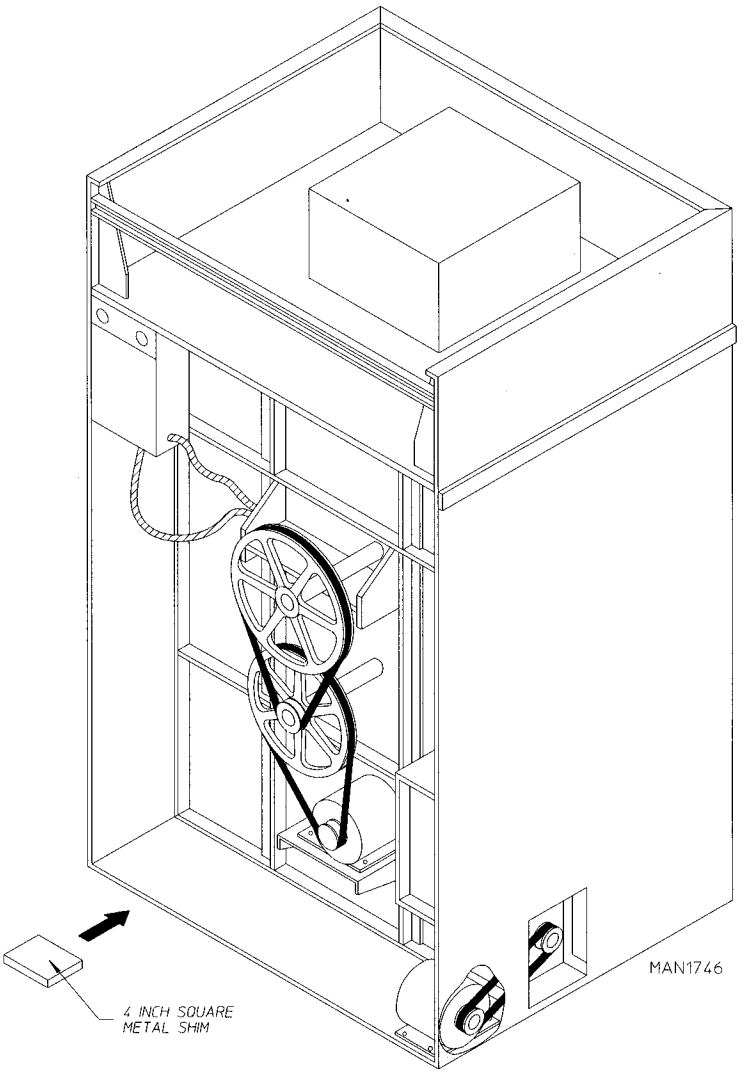
IMPORTANT: Dryer ***should be*** located where a minimum amount of exhaust duct will be necessary.

B. UNPACKING/SETTING UP

Remove protective shipping material (i.e., plastic wrap, and/or optional shipping box) from dryer.

IMPORTANT: Dryer ***must be*** transported and handled in an upright position at all times.

The dryer can be moved to its final location while still attached to the skid or with the skid removed. To un-skid the dryer, locate and remove the four (4) lag bolts securing the base of the dryer to the wooden skid. Two (2) are at the rear base, and two (2) are located in the bottom of the lint chamber. To remove the two (2) lag bolts located in the lint chamber area, remove the lint drawer and the three (3) Phillips head screws securing the lint door in place.



REAR VIEW

1. LEVELING DRYER

a. To level the dryer, place 4-inch metal shims or other suitable material under the base pads. It is suggested that the dryer be tilted slightly to the rear (refer to the illustration above).

b. The V-belts are disconnected from the tumbler drive motor for shipping. Reconnect V-belts before starting the dryer.

2. If more headroom is needed when moving the dryer into position, the top console (module) may be removed.

   a. To Remove Top Console (module)

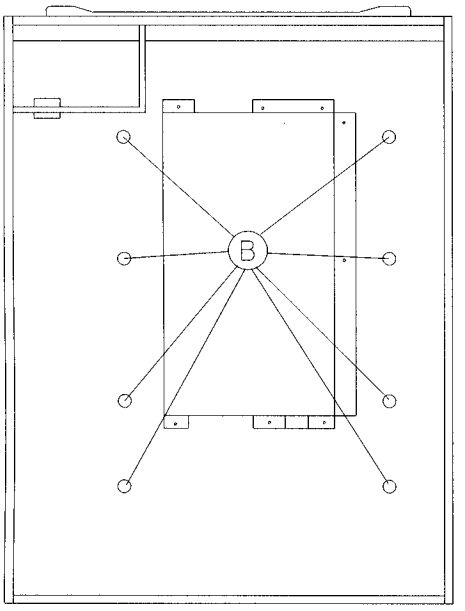
      1) Disconnect the ground wire (A in the illustration below) located at the rear upper left corner of the dryer.

      2) Remove the eight (8) sets of nuts and washers (B in the illustration below) holding the console (module) to the base.

      3) Disconnect the white plug (C) connector located on the top of the rear electric service/relay box (provides power to the heat circuit).

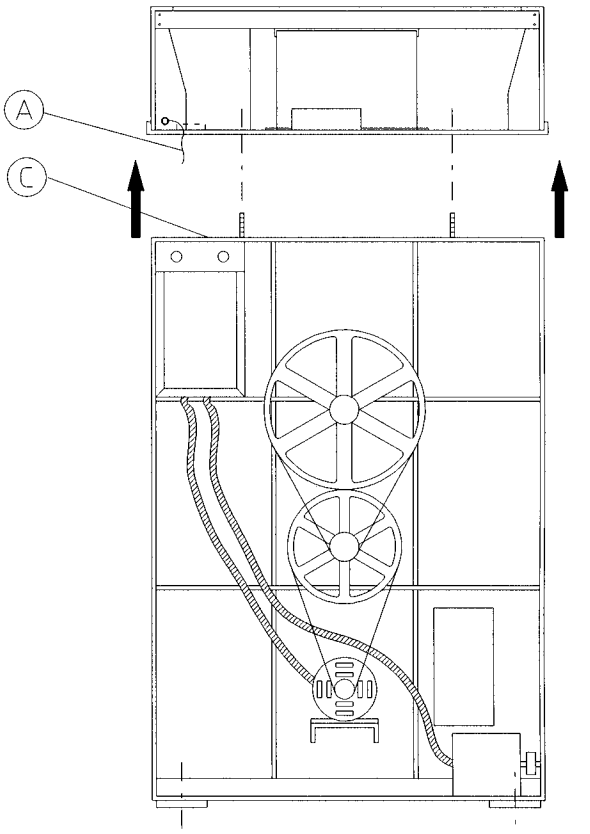
      4) Disconnect air connection from the 3-way micro valve.

      5) Lift the console (module) off of the dryer base.



TOP (CUT-AWAY) VIEW

MAN1749



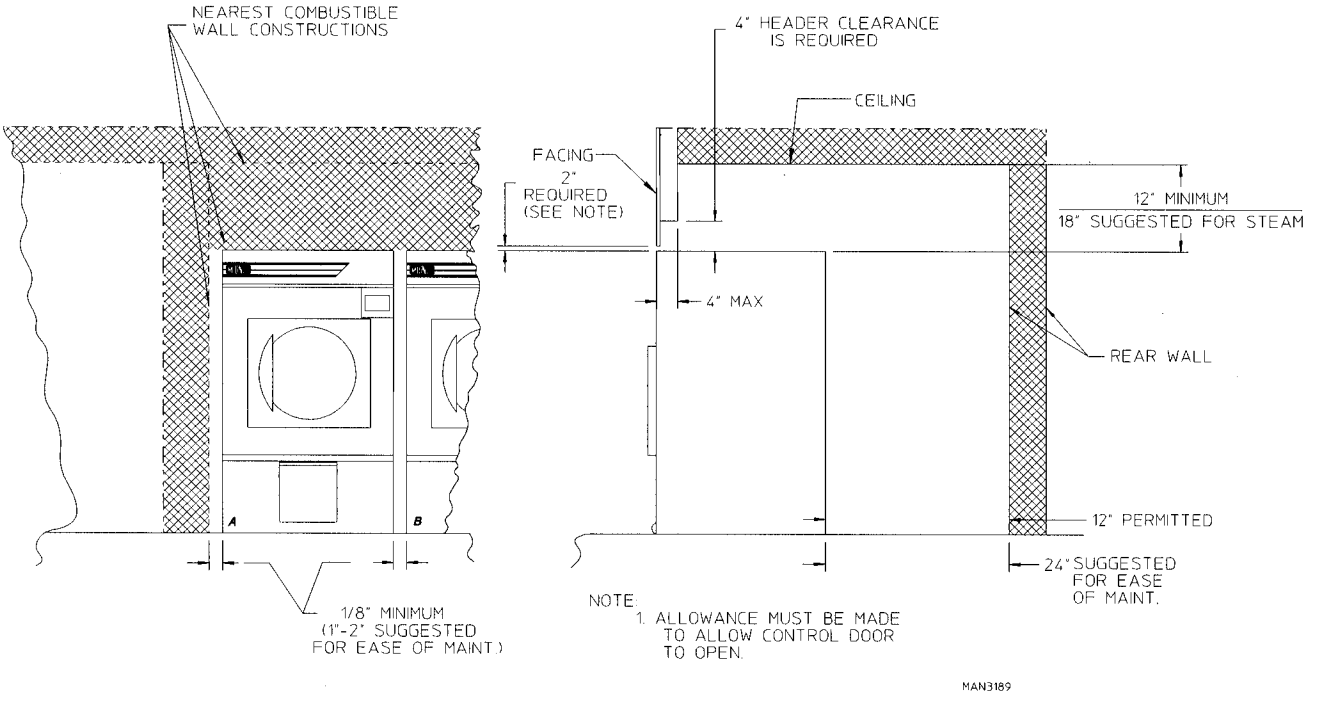
REAR VIEW

IMPORTANT: The dryer ***must be*** transported and handled in an upright position at all times.

C. DRYER ENCLOSURE REQUIREMENTS

Even though a 12-inch clearance is acceptable, it is recommended that the rear of the dryer be positioned approximately two (2) feet (24-inches) from the nearest obstruction (i.e., wall) for ease of installation, maintenance, and service. Bulkheads and partitions **should be** made from noncombustible materials. The clearance between the bulkhead header and the dryer **must be** a minimum of four (4) inches and **must not** extend more than four (4) inches to the rear of the front. A 2-inch clearance is required between the bulkhead facing and the top of the dryer.

NOTE: Bulkhead facing ***should not*** be installed until after the dryer is in place. Ceiling area ***must be*** located a minimum of 12-inches above the dryer top console (module) and 18-inches for steam models.



INSTALLATION: DRYER CLEARANCE TO ADJACENT WALL STRUCTURES

NOTE: When fire sprinkler systems are located above the dryers, a minimum of 18-inches above the dryer console (module) is required. Dryers may be positioned side wall to side wall; however, 1 or 2-inches is suggested for ease of installation and maintenance. Allowances ***must be*** made for the opening and closings of the control door and the lint door.

D. FRESH AIR SUPPLY REQUIREMENTS

When the dryer is operating, it draws in room air, heats it, passes this air through the basket (tumbler), and exhausts it out of the building. Therefore, the room air **must be** continually replenished from the outdoors. If the make-up air is inadequate, drying time and drying efficiency will be adversely affected. Ignition problems and sail switch "fluttering" problems may result, as well as premature motor failure from overheating.

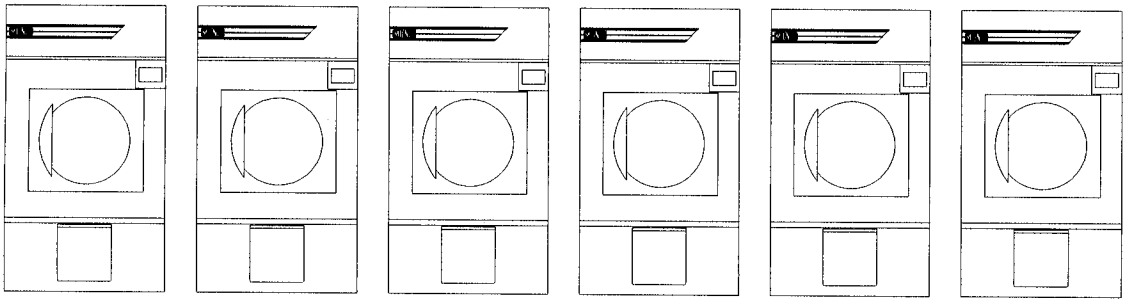
Air supply (make-up air) **must be** given careful consideration to assure proper performance of each dryer. An unrestricted source of air is necessary for each dryer. An air flow of 3,700 cfm (cubic feet per minute) **must be** supplied to each gas dryer and 4,400 cfm (cubic feet per minute) **must be** supplied to each steam dryer. As general rule, an unrestricted air entrance from the outdoors (atmosphere) of a minimum of four (4) square feet is required for each gas dryer and a minimum of 4.75 square feet for each steam dryer.

To compensate for the use of registers or louvers used over the openings, this make-up air **must be** increased by approximately thirty-three percent (33%). Make-up air openings **should not** be located in an area directly near where exhaust vents exit the building.

It is not necessary to have a separate make-up air opening for each dryer. Common make-up air openings are acceptable. However, they **must be** set up in such a manner that the make-up air is distributed equally to **ALL** the dryers.

EXAMPLE: For a bank of six (6) dryers, two (2) unrestricted openings measuring 3 feet by 4 feet (12 square feet each) is acceptable.

Allowances **must be** made for remote or constricting passageways or where dryers are located at excessive altitudes or predominantly low pressure areas.



TYPICAL INSTALLATION SHOWING MAKE-UP AIR OPENINGS

IMPORTANT: Make-up air ***must be*** provided from a source free of dry cleaning solvents fumes. Make-up air that is contaminated by dry cleaning solvent fumes will result in irreparable damage the motors and other dryer components.

NOTE: Component failure due to dry cleaning solvent fumes will VOID THE WARRANTY.

E. EXHAUST REQUIREMENTS

1. General Exhaust Duct Work Information

Exhaust duct work **should be** designed and installed by a qualified professional. Improperly sized duct work will create excessive back pressure which results in slow drying, increased use of energy, overheating of the dryer, and shutdown of the burner by the airflow (sail) switches, burner hi-limits, or basket (tumbler) hi-heat thermostats.

CAUTION: DRYER ***MUST BE*** EXHAUSTED TO THE OUTDOORS.

CAUTION: IMPROPERLY SIZED OR INSTALLED EXHAUST DUCT WORK CAN CREATE A POTENTIAL FIRE HAZARD.

NOTE: When a dryer is exhausted separately, it is recommended that a back draft damper be installed.

NOTE: When dryers are exhausted into a multiple (common) exhaust line, each dryer ***must be*** supplied with a back draft damper.

The duct work **should be** laid out in such a way that the duct work travels as directly as possible to the outdoors with as few turns as possible. Single or independent dryer venting is recommended.

When single dryer venting is used, the duct work from the dryer to the outside exhaust outlet **should not** exceed (20) feet. In the case of multiple (common) dryer venting, the distance from the last dryer to the outside exhaust outlet **should not** exceed (20) feet. The shape of the duct work is not so critical so long as the minimum cross sectional area is provided. It is suggested that the use of 90° turns ***be avoided***; use 30° and/or 45° bends/angles instead. The radius of the elbows **should preferably be** 1-1/2 times the diameter of the duct. Excluding basket (tumbler)/dryer elbow connections or elbows used for outside protection from the weather, no more than two (2) elbows **should be** used in the exhaust duct run. If more than two (2) elbows are used, the cross sectional area of the duct work **must be** increased in proportion to the number of elbows used.

ALL duct work **should be** smooth inside with no projections from sheet metal screws or other obstructions which will collect lint. When adding ducts, the duct to be added should overlap the duct to which it is to be connected. **ALL** duct work joints **must be** taped to prevent moisture and lint from escaping into the building. Inspection door **should be** installed at strategic points in the exhaust duct work for periodic inspection and clean-out of lint from the duct work.

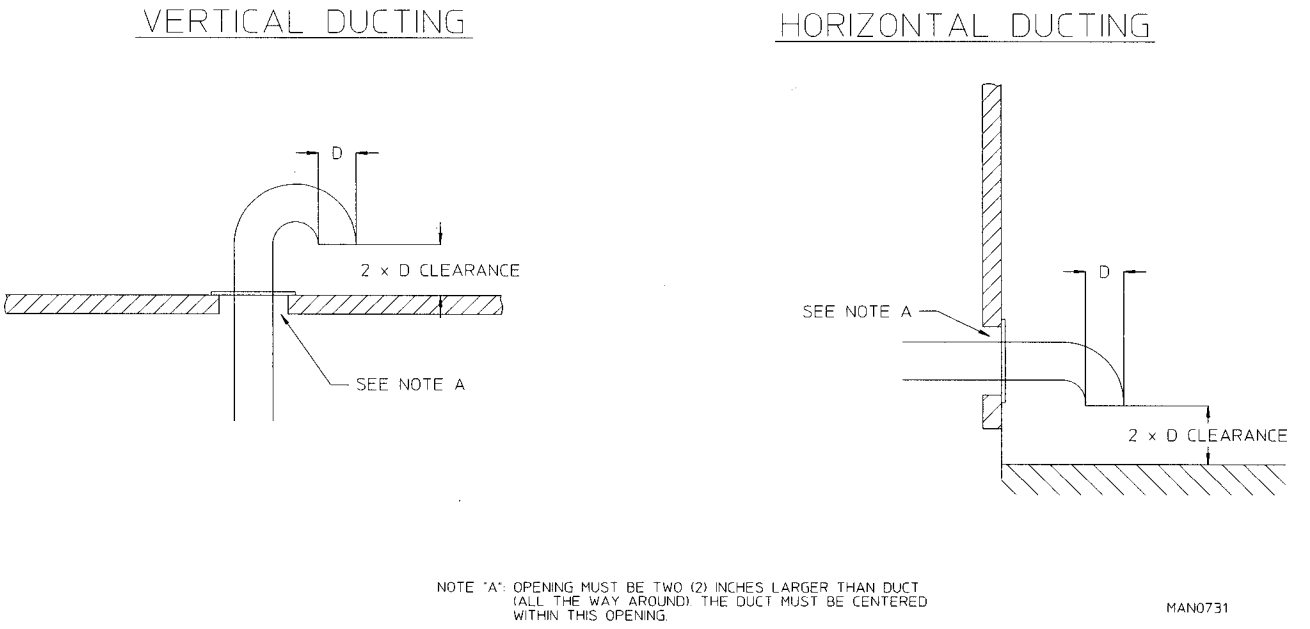
IMPORTANT: Exhaust back pressure measured by a manometer in the exhaust duct ***should not*** exceed 0.3 inches of water column.

NOTE: Where the exhaust duct work passes through a wall, ceiling, or roof made of combustible materials, the opening ***must be*** 2-inches larger (all the way around) than the duct. The duct ***must be*** centered within this opening.

a. Outside Duct Work Protection

1) To protect the outside end of horizontal duct work from the weather, a 90° elbow bent downward **should be** installed where the exhaust exits the building. If the duct work travels vertically up through the roof, it **should be** protected from the weather by using a 180° turn to point the opening downward. In either case, allow at least twice the diameter of the duct between the duct opening and the nearest obstruction.

IMPORTANT: DO NOT use screens or caps on the outside of opening of exhaust duct work.



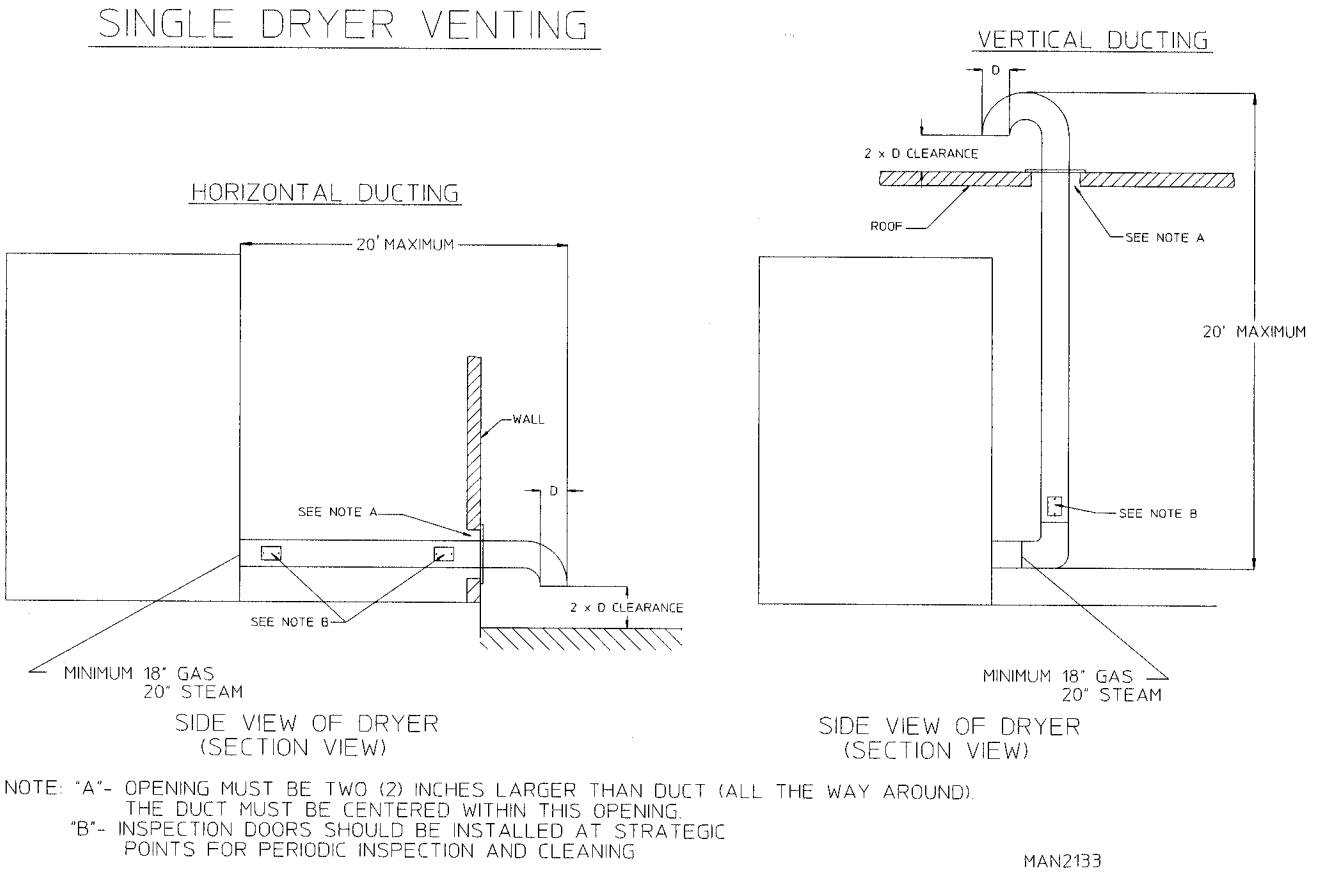
2. Single Dryer Venting

Where possible, it is suggested to provide a separate exhaust duct for each dryer. The exhaust duct **should be** laid out in such a way that the duct work travels as directly as possible to the outdoors with as few turns as possible. It is suggested that the use of 90° turns in the ducting be avoided; use 30° and/or 45° angles instead. The shape of the exhaust duct work is not critical so long as the minimum cross section area is provided.

IMPORTANT: The minimum duct size is 18-inches for a round duct 16" x 16" for a square duct. **THE DUCT SIZE *MUST NOT* BE REDUCED ANYWHERE DOWN STREAM OF THE DRYER.**

IMPORTANT: Exhaust back pressure measured by a manometer at each basket (tumbler) exhaust duct area ***should not*** exceed 0.3 inches of water column.

It is suggested that the duct work from each dryer **not exceed** twenty (20) feet with no more than two (2) elbows (excluding dryer connections). If the duct work exceeds twenty (20) feet or has numerous elbows, the cross sectional area of the duct work **must be** increased in proportion to the length and number of elbows in it. In calculating duct size, the cross-sectional area of a square or rectangular duct **must be** increased twenty (20) percent for each additional twenty (20) feet. The diameter of a round exhaust duct **should be** increased ten (10) percent for each additional fifteen (15) feet. Each 90° elbow is equivalent to an additional forty (40) feet, and each 45° elbow is equivalent to an additional twenty (20) feet.



NOTE: "A"- OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND). THE DUCT MUST BE CENTERED WITHIN THIS OPENING.
"B"- INSPECTION DOORS SHOULD BE INSTALLED AT STRATEGIC POINTS FOR PERIODIC INSPECTION AND CLEANING

MAN2133

IMPORTANT: For extended duct work runs, the cross section area of the duct work can only be increased to an extent. Maximum proportional duct work runs **cannot** exceed twenty (20) feet more than the original limitations of twenty (20) feet with two (2) elbows. When the duct work approaches the maximum limits as noted in this manual, a professional heating venting air conditioning (HVAC) firm ***should be*** consulted for proper venting information.

ALL duct work **should be** smooth inside with no projections from sheet metal screws or other obstructions which will collect lint. When adding ducts, the duct to be added should overlap the duct to which it is to be connected. **ALL** duct work joints **must be** taped to prevent moisture and lint from escaping into the building. Inspection doors **should be** installed at strategic points in the exhaust duct work for periodic inspection and clean-out of lint from the duct work.

NOTE: Where the exhaust duct passes through a wall, ceiling, or roof made of combustible materials, the opening ***must be*** 2-inches larger (all the way around) than the duct. The duct ***must be*** centered within this opening.

a. Outside Duct Work Protection

1) To protect the outside end of horizontal duct work from the weather, a 90° elbow bent downward **should be** installed where the exhaust exits the building. If the duct work travels vertically up through the roof, it **should be** protected from the weather by using a 180° turn to point the opening downward. In either case, allow at least twice the diameter of the duct between the duct opening and the nearest obstruction.

IMPORTANT: DO NOT use screens or caps on the outside of opening of exhaust duct work.

3. Multiple Dryer (Common) Venting

If it is not feasible to provide separate exhaust ducts for each dryer, ducts from individual dryers may be channeled into a "common main duct." The individual ducts **should enter** the bottom or side of the main duct at an angle not more than 45° in the direction of the flow and **should be** spaced at least 55-5/8 inches apart. The main duct **should be** tapered, with the diameter increasing before each individual 18-inch duct is added.

IMPORTANT: The M-170 **is not** provided with a back draft damper. When exhausted into a multiple (common) exhaust line, a back draft damper ***must be*** installed at each dryer duct.

IMPORTANT: No more than three (3) dryers ***should be*** connected to one (1) main common duct.

The main duct may be any shape or cross sectional area, so long as the minimum cross section area is provided. The **illustrations** on **page 20** show the minimum cross section area for multiple dryer round or square venting. These figures **must be** increased 10 square inches when rectangular main ducting is used, and the ratio of duct width to depth **should not** be greater than 3-1/2 to 1. These figures **must be** increased in proportion if the main duct run to the last dryer towhere it exhausts to the outdoors is unusually long (over twenty [20] feet) or has numerous elbows (more than two [2]) in it. In calculating duct work size, the cross sectional area of a square or rectangular duct **must be** increased twenty (20) percent for each additional twenty (20) feet. The diameter of a round exhaust **must be** increased ten (10) percent for each additional twenty (20) feet. Each 90° elbow is equivalent to an additional forty (40) feet and each 45° elbow is equivalent to an additional twenty (20) feet.

IMPORTANT: For extended duct work runs, the cross section area of the duct work can only be increased to an extent. Maximum proportional duct work runs **cannot** exceed twenty (20) feet more than the original limitations of twenty (20) feet with two (2) elbows. When the duct work approaches the maximum limits as noted in this manual, a professional heating venting air conditioning (HVAC) firm ***should be*** consulted for proper venting information.

IMPORTANT: Exhaust back pressure measured by a manometer in the exhaust duct**should not** exceed 0.3 inches of water column.

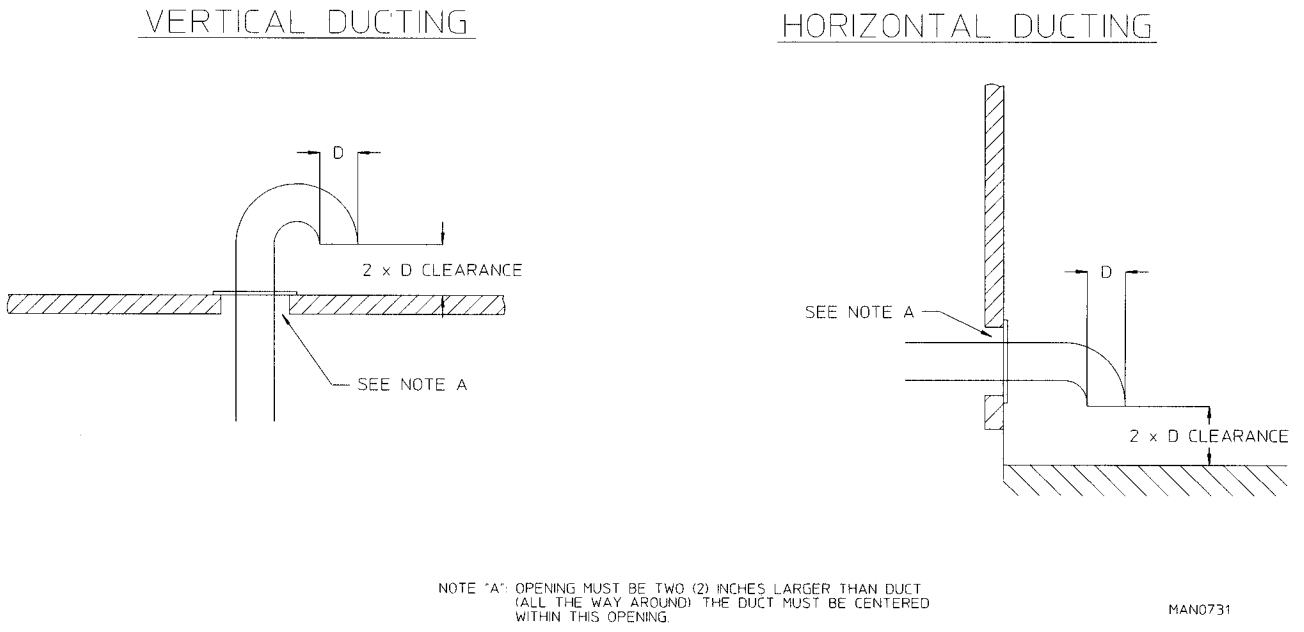
The duct work **should be** smooth inside with no projections from sheet metal screws or other obstructions which will collect lint. When adding ducts, the duct to be added should overlap the duct to which it is to be connected. **ALL** duct work joints **must be** taped to prevent moisture and lint from escaping into the building. Inspection doors **should be** installed at strategic points in the exhaust duct work for periodic inspection and clean-out of lint from the duct work.

NOTE: Where the exhaust duct passes through a wall, ceiling, or roof made of combustible materials, the opening ***must be*** 2-inches larger (all the way around) than the duct. The duct ***must be*** centered within this duct.

a. Outside Duct Work Protection

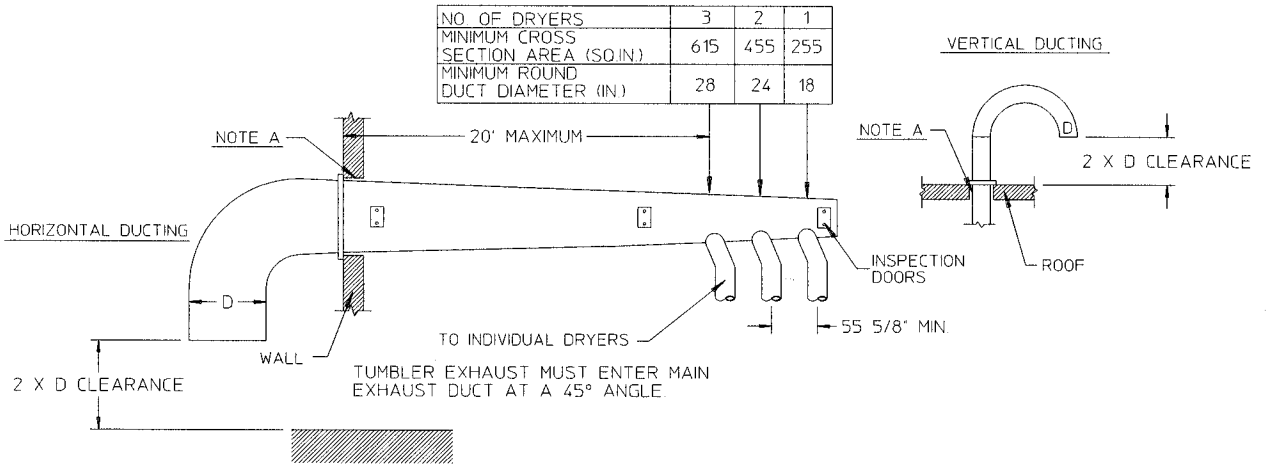
1) To protect the outside end of horizontal duct work from the weather, a 90° elbow bent downward **should be** installed where the exhaust exits the building. If the exhaust duct work travels vertically up through the roof, it **should be** protected from the weather by using a 180° turn to point the opening downward. In either case, allow at least twice the diameter of the duct between the duct opening and the nearest obstruction.

IMPORTANT: ***DO NOT*** use screens or caps on the outside of opening of exhaust duct work.



MULTIPLE DRYER VENTING (GAS MODELS)
WITH 18" DIAMETER (3700 CFM) EXHAUST CONNECTIONS AT COMMON DUCT

NO. OF DRYERS	3	2	1
MINIMUM CROSS SECTION AREA (SQ.IN.)	615	455	255
MINIMUM ROUND DUCT DIAMETER (IN.)	28	24	18

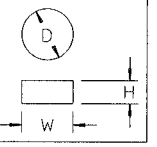


IMPORTANT: NO MORE THAN 3 DRYERS CAN BE CONNECTED TO ONE COMMON DUCT (VENT).

FORMULAS TO CALCULATE DUCTING CROSS SECTIONAL AREA

CROSS SECTIONAL AREA OF A ROUND DUCT = .785 x D^2 WHERE D = DIAMETER OF THE DUCT.

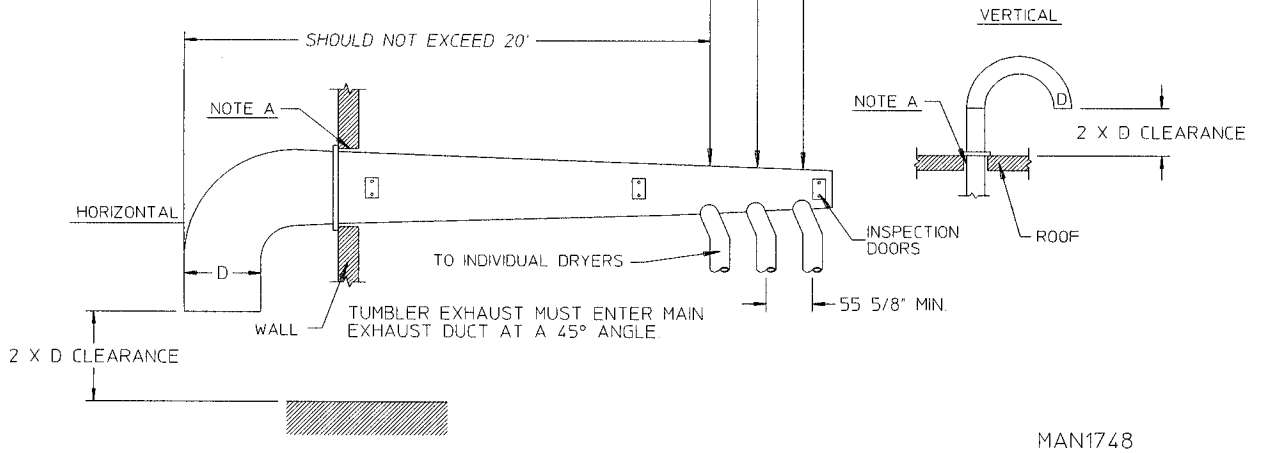
CROSS SECTIONAL AREA OF A RECTANGULAR DUCT = W x H WHERE W = WIDTH AND H = HEIGHT.



NOTE A: OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND). THE DUCT MUST BE CENTERED WITHIN THIS OPENING.

MULTIPLE DRYER VENTING (STEAM MODELS)
WITH 20" DIAMETER (4400 CFM) EXHAUST CONNECTIONS AT COMMON DUCT

NO. OF DRYERS	3	2	1
MINIMUM CROSS SECTION AREA (SQ.IN.)	707	531	315
MINIMUM ROUND DUCT DIAMETER (IN.)	30	26	20



MAN1748

IMPORTANT: NO MORE THAN 3 DRYERS CAN BE CONNECTED TO ONE COMMON DUCT (VENT).

F. ELECTRICAL INFORMATION

1. Electrical Requirements

It is your responsibility to have **ALL** electrical connections made by a properly licensed and competent electrician to assure that the electrical installation is adequate and conforms with local and state regulations or codes. In the absence of such codes, **ALL** electrical connections, material, and workmanship **must conform** to the applicable requirements of the National Electrical Code ANSI NFPA NO.70-LATEST EDITION.

IMPORTANT: Failure to comply with these codes or ordinances, and/or the requirements stipulated in this manual can result in personal injury or component failure.

NOTE: Component failure due to improper installation will VOID THE WARRANTY.

Each dryer **should be** connected to an independently protected branch circuit. The dryer **must be** connected with copper wire only. **DO NOT use aluminum wire which could cause a fire hazard.** The copper conductor wire/cable **must be** of proper ampacity and insulation in accordance with electric codes for making **ALL** service connections.

NOTE: The use of aluminum wire will VOID THE WARRANTY.

NOTE: Wiring diagrams are affixed to the inside at the top front control door and the rear upper back guard/panel.

2. Electrical Service Specifications

MLG-170 (Gas)
MLS-170 (Steam)

ELECTRIC SERVICE SPECIFICATIONS (per dryer)

IMPORTANT: 208 VAC and 230/240 VAC **ARE NOT THE SAME. When ordering, specify *exact voltage*.**

NOTE: A. Fuse ratings are dual-element, time-delay, current limiting, class RK1 or RK5 **ONLY**.
B. Circuit breakers are thermal magnetic (industrial) type **ONLY**. For others, calculate/verify correct breaker size according to appliance amp draw rating and type of breaker used.
C. Circuit breakers for 3-phase dryers **must be** 3-pole type.

SERVICE VOLTAGE	PHASE	WIRE SERVICE	APPROX. AMP DRAW		MINIMUM WIRE SIZE*	FUSING Dual Element Time Delay	CIRCUIT BREAKER
			60 Hz	50 Hz			
208	3ø	3	27	--	#8	50	60
240	3ø	3	26	--	#8	40	60
380	3ø	3/4	--	15	#10	25	30
416	3ø	3/4	--	14	#10	25	30
440	3ø	3/4	14	--	#12	25	30
480	3ø	3/4	13	--	#12	25	30

* AWG Stranded Type Wire...for individual lengths less than 100 feet.

IMPORTANT: The dryer ***must be*** connected to the electric supply shown on the data label that is affixed to the back of the dryer, at the upper right hand corner. In the case of 208 VAC or 230/240 VAC, the supply voltage ***must match*** the electric service specifications of the data label exactly.

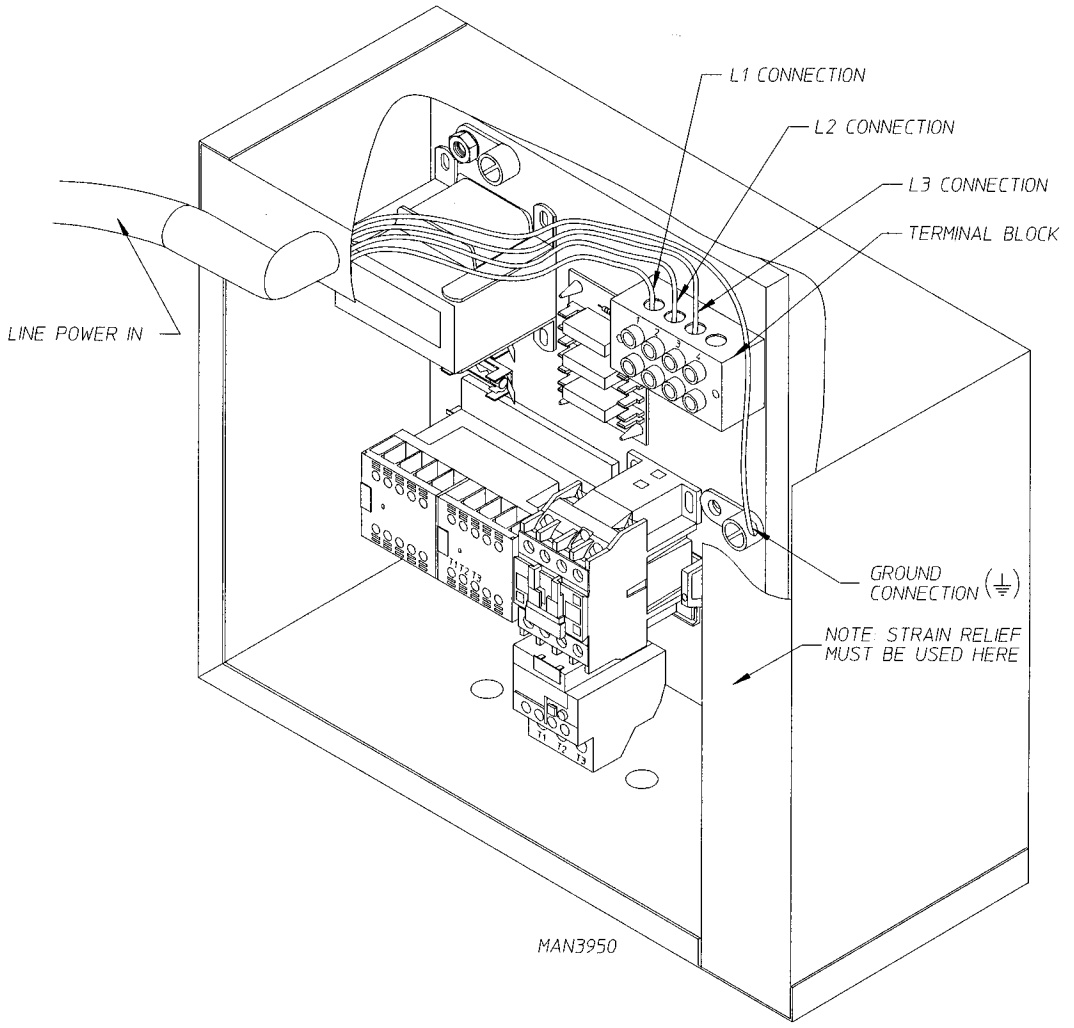
WARNING: **208 VAC and 230/240 VAC ARE NOT THE SAME.** Any damage done to dryer components due to improper voltage connections will automatically VOID THE WARRANTY.

NOTE: **ADC** reserves the right to make changes in specifications at any time, without notice or obligation.

3. Electrical Connections

NOTE: A wire diagram is included with each dryer and is affixed to the back side of the top control (access) door.

The only electrical input connections to the dryer are the 3-phase (3ø) power leads (L1,L2, and L3), GROUND, and in the case of 4 wire service, the NEUTRAL. These electrical connections are made at the terminal block located in the service/relay box at the rear, upper left hand corner of the dryer. To gain access into this service box, the service cover **must be** removed.



The "LINE POWER" and the "GROUND" connections to the dryer **must be** made through the knock out hole at the top of the electric service/relay box. A strain relief **must be** used where the line power ground wires go into the electric service/relay box.

Providing local codes permit, power connections to the dryer can be made by use of a flexible underwriters laboratory list cord/pigtail (wire **must conform** to ratings of the dryer), or the dryer can be hard wired directly to the service breaker. In **ALL** cases, a strain relief **must be** used where the wire(s) enter the dryer electrical service (relay) box.

NOTE: A CIRCUIT SERVING EACH DRYER *MUST BE* PROVIDED.

4. GROUNDING

Grounding (earth) connections **must be** provided and installed in accordance with state and local codes. In the absence of these codes, grounding **must conform** to applicable requirements of the National Electrical Code ANSI/NFPA NO. 70-LATEST EDITION. The ground connection may be to a proven earth ground at the location service panel.

NOTE: A grounding connection (terminal lug) is provided in the in the dryers electrical service/ relay box at the rear, upper left hand corner of the dryer.

For added personal safety, when possible, it is suggested that a separate ground wire (sized per local codes) be connected from the ground connection of the dryer to a grounded cold water pipe. **DO NOT ground to a gas pipe or hot water pipe.** The grounded cold water pipe **must have** metal to metal connection all the way to the electrical ground. If there are any non-metallic interruptions, such as a meter, pump, plastic, rubber, or other insulating connectors, they **must be** jumped out with no. 4 copper wire and securely clamped to bare metal at both ends.

IMPORTANT: For personal safety and proper operation, the dryer ***must be*** grounded. For proper operation of the microprocessor (computer), an earth (zero) ground ***is required.***

NOTE: Grounding via metallic electrical conduit (pipe) ***is not recommended.***

G. GAS INFORMATION

It is your responsibility to have **ALL** plumbing connections made by a qualified professional to assure that the gas plumbing installation is adequate and conforms with local and state regulations or codes. In the absence of such codes, **ALL** plumbing connections, materials, and workmanship **must conform** to the applicable requirements of the National Fuel Gas Code ANSI Z223.1-LATEST EDITION.

IMPORTANT: Failure to comply with these codes or ordinances, and/or the requirements stipulated in this manual, can result in personal injury and improper operation of the dryer.

The dryer and its individual shut-off valves **must be** disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa). The dryer **must be** isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure test of the gas supply system at test pressures equal to or less than 1/2 psig (3.5 kPa).

IMPORTANT: Failure to isolate or disconnect dryer from supply as noted can cause irreparable damage to the gas valve which will VOID THE WARRANTY.

WARNING: FIRE or EXPLOSION COULD RESULT.

1. Gas Supply

The gas dryer installation **must meet** the American National Standard...National Fuel Gas Code ANSI Z223.1-LATEST EDITION, as well as local codes and ordinances and **must be** done by a qualified professional.

NOTE: Undersized gas piping will result in ignition problems, slow drying, increased use of energy, and can create a safety hazard.

The dryer **must be** connected to the type of heat/gas indicated on the dryer label affixed to the left inside front side panel (refer to the **illustration** in **Section VIII** of this manual). *If this information **does not agree** with the type of gas available, **DO NOT OPERATE THE DRYER**.* Contact the distributor who sold the dryer or the **ADC** factory.

IMPORTANT: Any burner changes or conversions ***must be*** made by a qualified professional.

The input ratings shown on the dryer data label are for elevations up to 2,000 feet, unless elevation requirements of over 2,000 feet were specified at the time the dryer order was placed with the factory. The adjustment or conversion of dryers in the field for elevations over 2,000 feet are made by changing each burner orifice. If this conversion is necessary, contact the distributor who sold the dryer or contact the **ADC** factory.

2. Technical Data

a. Gas Specifications

	Type of Gas	
	Natural Gas	Liquid Propane Gas
Manifold Pressure*	3.5 - 4.0 inches W.C.	10.5 - 11.0 inches W.C.
Inline Pressure	6.0 - 12.0 inches W.C.	11.0 inches W.C.

* Measured at the gas valve pressure tap when the gas valve is on.

b. Gas Connections:

Inlet connection ---------- 1-1/2-inch N.P.T.
Inlet supply size ---------- 1-1/2-inch N.P.T. (minimum)

Btu/hr input (per dryer) - 550,000

1) Natural Gas

Regulation is controlled by the dryer's gas valve's internal regulator. Incoming supply pressure **must be** consistent between a minimum of 6.0 inches and a maximum of 12.0 inches water column (W.C.) pressure.

2) Liquid Propane (L.P.) Gas

Dryers made for use with L.P. gas have the gas valve's internal pressure regulator blocked open so that the gas pressure **must be** regulated upstream of the dryer. The pressure measured at each gas valve pressure tap **must be** a consistent 11.0 inches water column (W.C.). There is no regulator or regulation provided in an L.P. dryer. The water column pressure **must be** regulated at the source (L.P. tank) or an external regulator **must be** added to each dryer.

MODEL NUMBER	BTU Per Hour Rating	Type of Gas						L.P. Conversion Kit Part Number
		Natural			Liquid Propane			
		Qty.	D.M.S.*	Part Number	Qty.	D.M.S.*	Part Number	
M-170	550,000	4	#2	140839	3	#29	140820	880978

* D.M.S. (Drill Material Size) equivalents are as follows:

Natural Gas ..... #2 = .2210"
Liquid Propane Gas ... #29 = .1360"

3. Piping/Connections

ALL components/materials **must conform** to National Gas Code Specifications. It is important that gas pressure regulators meet applicable pressure requirements and that gas meters be rated for the total amount of **ALL** the appliance BTU's being supplied.

The dryer is provided with a 1-1/2 inch N.P.T. inlet pipe connection extending out the back area of the burner box. The minimum pipe size (supply line) to the dryer is 1-1/2 inch N.P.T. For ease servicing, the gas supply line of each dryer **must have** its own shut-off valve.

The size of the main gas supply line (header) will vary depending on the distance this line travels from the gas meter or, in the case of L.P. (liquid propane) gas, the supply tank, other gas-operated appliances on the same line, etc. Specific information regarding supply line size **should be** determined by the gas supplier.

NOTE: Undersized gas supply piping can create a low or inconsistent pressure which will result in erratic operation of the burner ignition system.

Consistent gas pressure is essential at **ALL** gas connections. It is recommended that a 1-1/2 inch pipe gas loop be installed in the supply line serving a bank of dryers. An in-line pressure regulator **must be** installed in the gas supply line (header) if the (natural) gas pressure exceeds 12.0 inches of water column (W.C.) pressure.

NOTE: A water column (W.C.) test pressure of 3.5-4.0 inches for natural gas and 11.0 inches for L.P. (liquid propane) dryers is required at the gas valve pressure tap of each dryer for proper and safe operation.

A 1/8" N.P.T. plugged tap, accessible for a test gauge connection, **must be** installed in the main gas supply line immediately upstream of each dryer.

IMPORTANT: Pipe joint compounds that resist the action of natural gas and L.P. gas ***must be*** used.

IMPORTANT: Test **ALL** connections for leaks by brushing on a soapy water solution (liquid detergent works well).

WARNING: NEVER TEST FOR LEAKS WITH A FLAME!!!

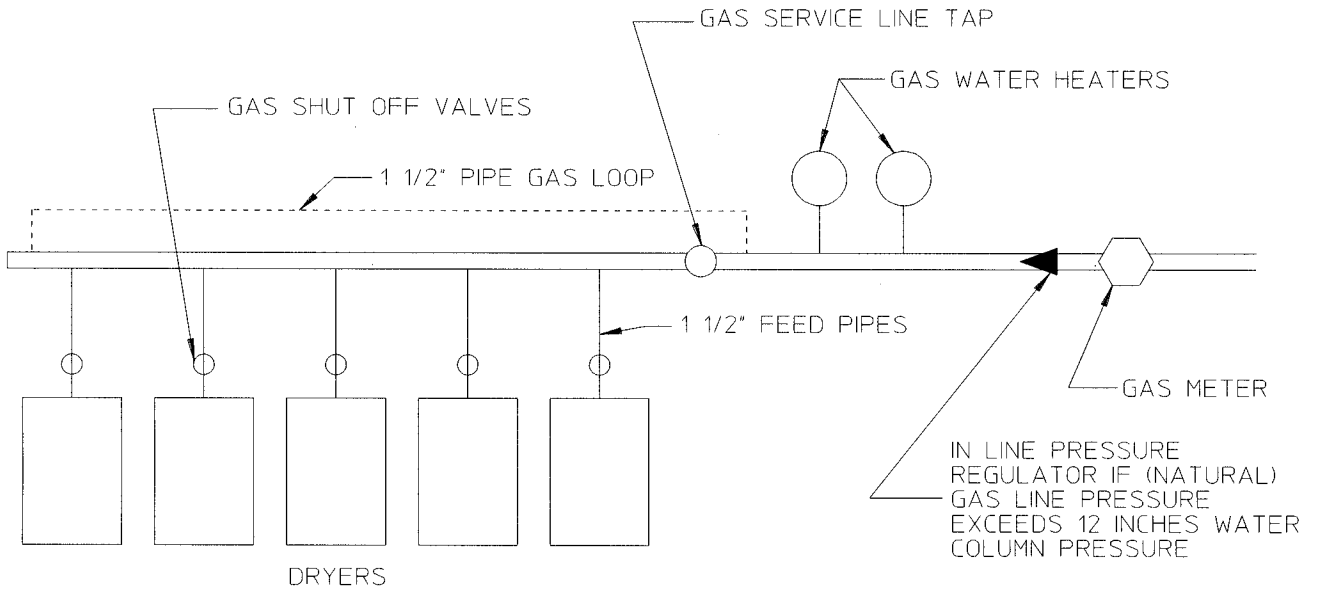
ALL components/materials **must conform** to National Gas Code Specifications ANSI Z223.1-LATEST EDITION.

It is important that gas pressure regulators meet applicable pressure requirements and that gas meters be rated for the total amount of **ALL** the appliance BTU's being supplied.

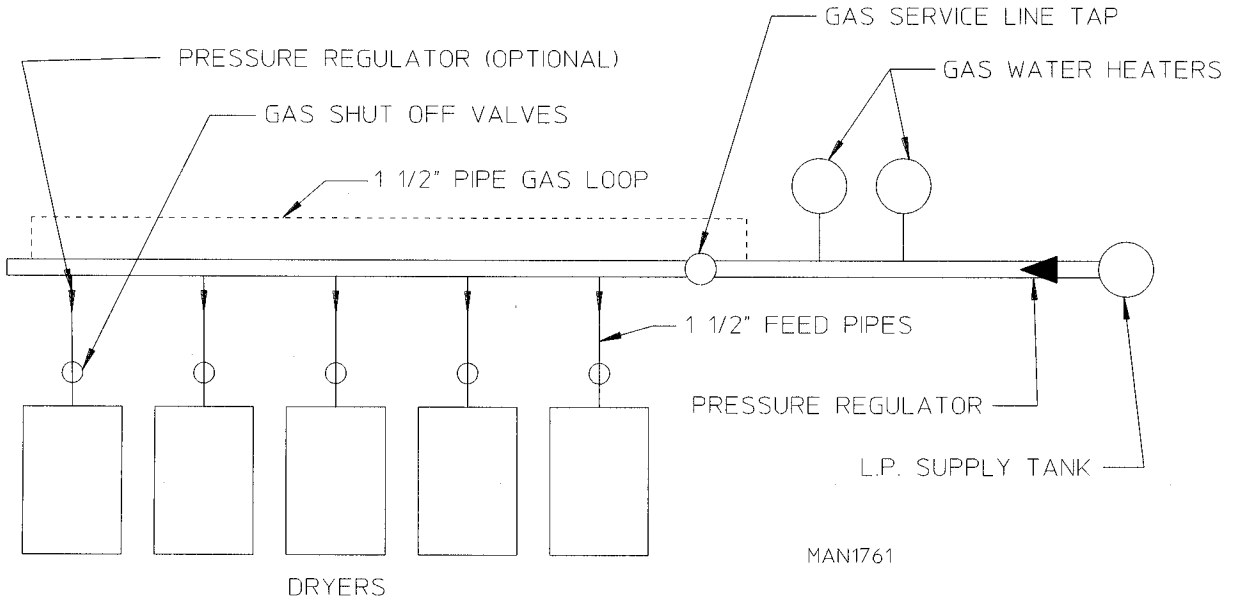
IMPORTANT: The dryer and its individual shut-off valve ***must be*** disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa).

NOTE: The dryer ***must be*** isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure test of the gas supply system at test pressures equal to or less than 1/2 psig (3.5 kPa)

TYPICAL NATURAL GAS INSTALLATION



TYPICAL L.P. GAS INSTALLATION



H. STEAM INFORMATION

It is your responsibility to have **ALL** steam plumbing connections made by a qualified professional to assure that the installation is adequate and conforms with local and state regulations or codes.

IMPORTANT: Failure to comply with the requirements stipulated in this manual can result in component failure which will VOID THE WARRANTY.

NOTE: The M-170 is manufactured with a pneumatic (piston) damper system which requires an external supply of clean, dry, regulated air (80 PSI +/- 10 PSI). Refer to **Steam Damper Air System Connections, Section H, item 4.**

1. Steam Coil PH Level

The normal PH level for copper type steam coils **must be** maintained between a value of 8.5 to 9.5. For steel type steam coils the PH level **must be** maintained between a value of 9.5 to 10.5. These limits are set to limit the acid attack of the steam coils.

IMPORTANT: Coil failure due to improper PH level will VOID THE WARRANTY.

2. Steam Requirements - High Pressure

Inlet -------- 1-1/2" supply line connection -- qty. one (1) at top manifold.
Return ----- 1-1/2" return line connection --- qty. one (1) at bottom manifold.

Operating Steam Pressure	
Maximum	125 psig
Minimum	100 psig*
Heat Input (Normal Load)	19 Bhp
Consumption (approximate)	725 lbs/hr

* Minimum operating pressure for optimum drying results.

3. Installation Instructions

To insure an adequate supply of steam is provided, be sure that the steam lines and steam return lines are sized and laid out as stipulated in this manual. Inadequate steam lines and steam return lines or improper steam plumbing will result in poor performance and can cause component failure. Clean, dry steam **must be** provided to the dryer.

IMPORTANT: Steam coil failure due to water hammer by wet steam will VOID THE WARRANTY.

a. The pressure of the condensate in the steam supply will cause water hammer and subsequent heat exchanger (steam coil) failure. The steam supply connection into the main supply line **must be** made with a minimum 10-inch riser. This will prevent any condensate from draining towards the dryer.

b. The steam supply piping to the dryer **must include** a 12-inch rise along with a drip trap and check valve. This will prevent any condensate from entering the steam coil.

c. Flexible hoses or couplings **must be** used. The dryer vibrates slightly when it runs and this will cause the steam coil connections to crack if they are hard piped to the supply and return mains.

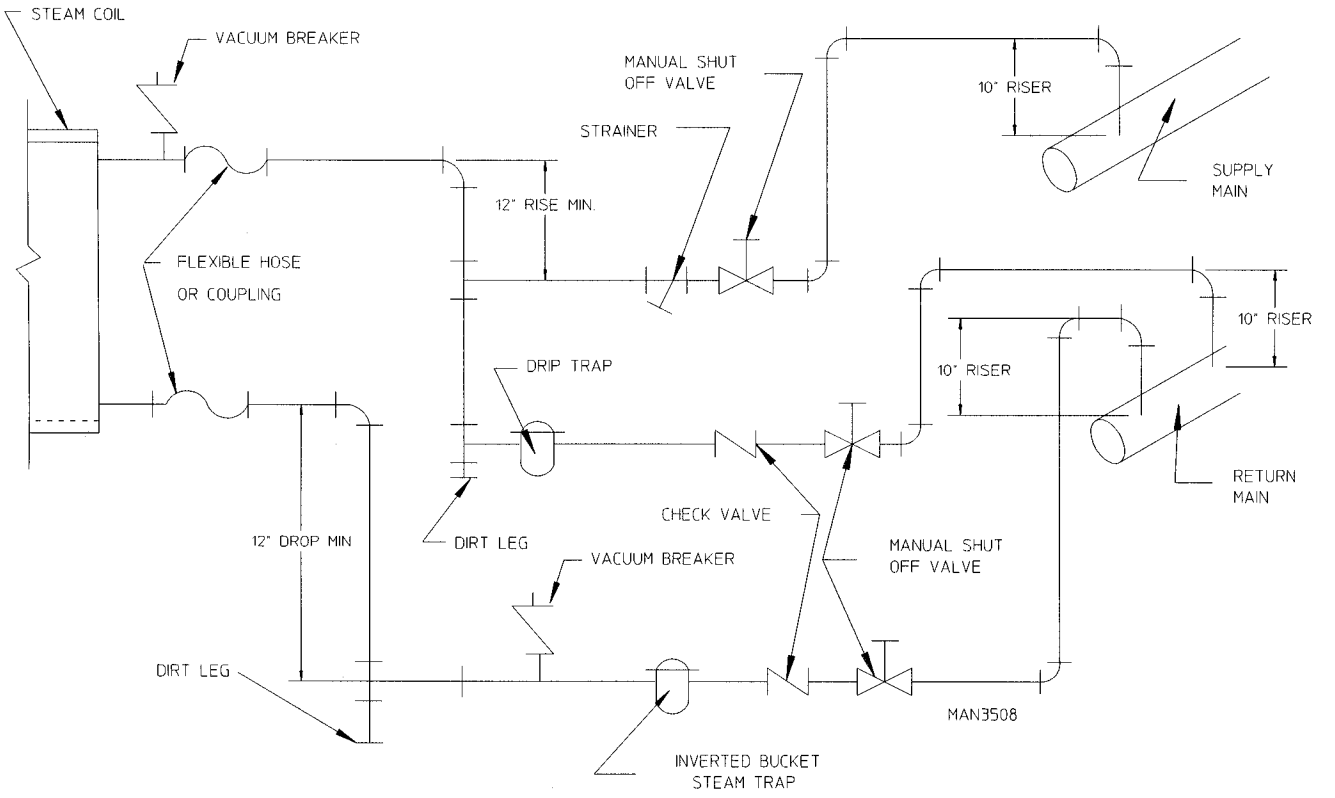
d. Shut-off valves for each dryer **should be** installed in the supply line, return line, and drip trap return line. This will allow the dryer to be isolated from the supply main and the return main if the dryer needs maintenance work.

e. Install an inverted bucket steam trap and check valve at least 12-inches below the steam coil as close to the coil as possible.

   1) An inverted bucket steam trap with capacity of 1,400 pounds of condensate per hour @ 125 psi **is required** for each dryer.

f. A 3/4" vacuum breaker **should be** installed. This will save energy and provide for the safety of the operator and maintenance personel.

g. Water pockets in the supply line, caused by low points, will provide wet steam to the coil possibly causing steam coil damage. **ALL** horizontal runs of steam supply piping **should be** pitched 1/4-inch for every one (1) foot back torwards the steam supply header causing the condensate in the line to drain to the header. Install a bypass trap in any low point to eliminate wet steam.



STEAM DAMPER SYSTEM

4. Steam Damper Air System Connections

The M-170 is manufactured with a pneumatic (piston) damper system which requires an external supply of compressed air. The air connection is made to the steam damper solenoid valve which is located at the rear inner top area of the dryer just in front of the electric service relay box. (Refer to the **bottom illustration** on **page 32**).

a. Air Requirements

Compressed Air Supply	Air Pressure
Normal	80 PSI
Minimum Supply	70 PSI
Maximum Supply	90 PSI

b. Air Connection

Air connection to system --- 1/8-inch N.P.T.

c. No air regulator or filtration is provided with the dryer. External regulation/filtration of 80 PSI **must be** provided. It is suggested that a regulator/filter gauge arrangement be added to the compressed air line just before the dryer connection. This is necessary to insure that correct and clean air pressure is achieved.

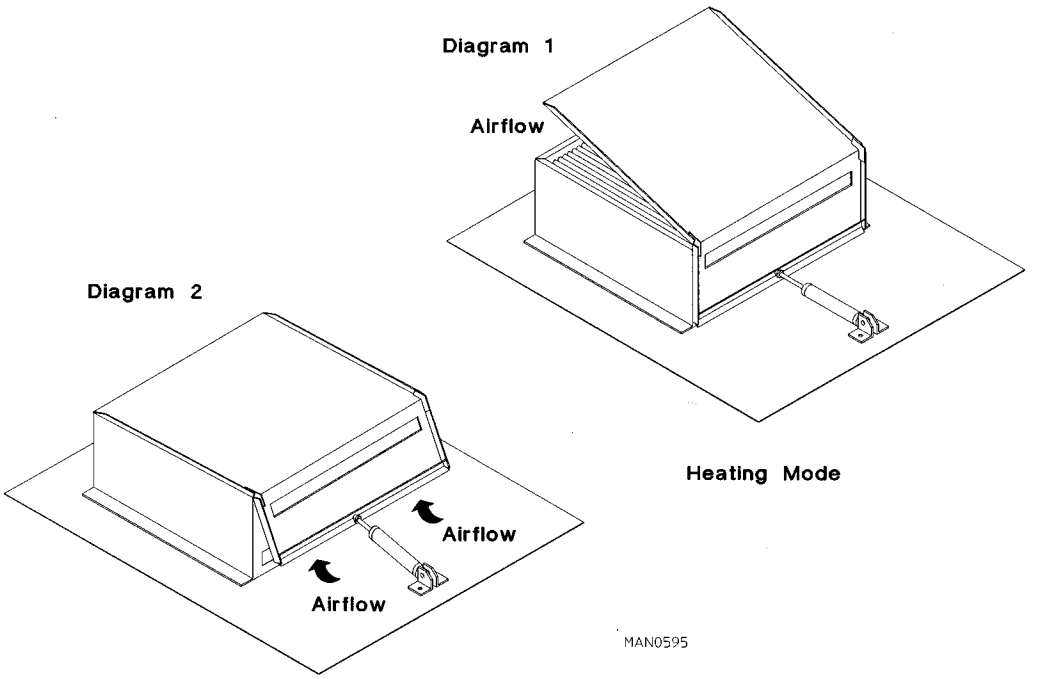
5. Steam Damper System Operation

The M-170 steam damper as shown in the **top illustration** on **page 32**, allows the coil to stay constantly charged eliminating repeated expansion and contraction. When the damper is opened, the air immediately passes through the already hot coil, providing instant heat to start the drying process. When the damper is closed, ambient air is drawn directly into the basket (tumbler), allowing a rapid cool down.

Diagram 1 shows the damper in the heating (open) mode, allowing heat into the tumbler.

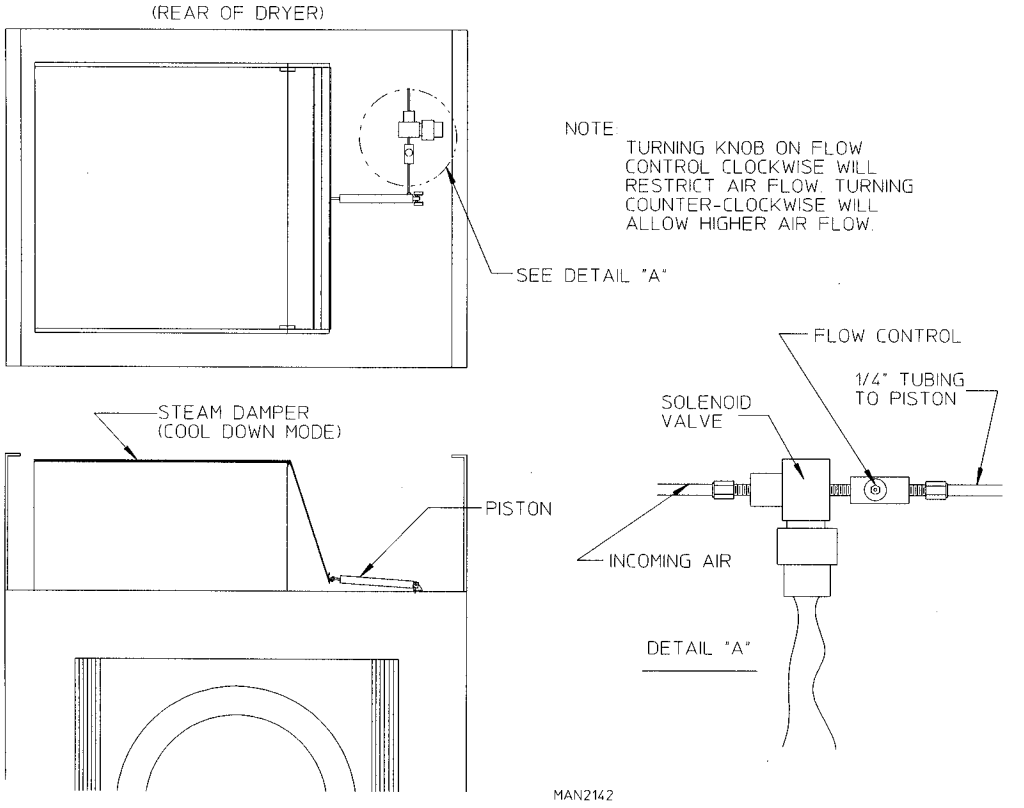
Diagram 2 shows the damper in the cool down (closed) mode, pulling ambient air directly into the basket (tumbler) without passing through the coils.

NOTE: With the dryer off or with no air supply, the steam damper is in cool down mode as shown in Diagram 2.



5. Steam Damper Air Piston (Flow Control) Operation Adjustment

Although the steam damper operation was tested and adjusted prior to shipping at 80 PSI, steam damper operation **must be** checked before the dryer is put into operation. Refer to the illustration above for correct steam damper operation. If steam damper adjustment is necessary, locate the flow control valve and make the necessary adjustments as noted below.



I. PREPARATION FOR OPERATION/START-UP

The following items **should be** checked before attempting to operate the dryer:

1. Read **ALL** "**CAUTION,**" "**WARNING,**" and "**DIRECTION**" labels attached to the dryer.

2. Check incoming supply voltage to be sure that it is the same as indicated on the dryer data label affixed to the left inside front side panel (refer to the **illustration** in **Section VIII** of this manual). In the case of 208 VAC or 230/240 VAC **THE SUPPLY VOLTAGE *MUST MATCH* THE ELECTRIC SERVICE *EXACTLY.***

3. GAS MODELS - check to assure that the dryer is connected to the type of heat/gas indicated on the dryer data label.

4. GAS MODELS - the sail switch damper assembly was installed and pre-adjusted at the factory prior to shipping. However, each sail switch adjustment **must be** checked to assure that this important safety control is functioning.

5. Check to be sure that the drive belts between the idler pulley and the motor pulley have been re-connected.

NOTE: The drive belts were disconnected at the factory prior to dryer shipment.

6. GAS MODELS - be sure that **ALL** gas shut-off valves are in the open position.

7. Be sure **ALL** back panels (guards) and electric box covers have been replaced.

8. Check **ALL** service doors to assure that they are closed and secured in place.

9. Be sure the lint drawer is securely in place.

NOTE: LINT DRAWER *MUST BE* ALL THE WAY IN PLACE TO ACTIVATE THE SAFETY SWITCH OTHERWISE THE DRYER WILL NOT START.

10. Rotate the basket (tumbler/drum) by hand to be sure it moves freely.

11. Check bolts, nuts, screws, terminals, and fittings for security.

12. GAS MODELS and STEAM MODELS - check to insure air supply (80 PSI) is connected to the dryer.

13. STEAM MODELS - check to insure **ALL** steam shut-off valves are open.

14. STEAM MODELS - check steam damper operation.

15. Check tumbler bearing set screws to insure they are **ALL** tight.

J. PREOPERATIONAL TESTS

ALL dryers are thoroughly tested and inspected before leaving the factory. However, a preoperational test **should be** performed before the dryer is publicly used. It is possible that adjustments have changed in transit or due to marginal location (installation) conditions.

1. Turn on electric power to the dryer.

2. Make sure the main door is closed and the lint drawer is securely in place.

3. Refer to the Operating Instructions for starting your particular model dryer.

4. Check to insure that the basket (tumbler) starts in the clockwise (CW) direction. Additionally, check the direction of the blower motor impellor (fan) to insure that the impellor (fan) rotates in the clockwise (CW) direction as viewed from the front. If it is, the phasing is correct. If the phasing is incorrect, reverse two (2) of the leads at L1, L2, or L3 of the power supply connections made to the dryer.

IMPORTANT: Dryer blower motor/pulley that drives the impellor/fan (squirrel cage) when viewed from the back of the dryer ***must turn*** in the counterclockwise (CCW) direction, otherwise the dryer efficiency will be drastically reduced and premature component failure can result.

5. Heat Circuit Operational Test

   a. Gas Models

      1) When the dryer is first started (during initial start-up), the burner has a tendency not to ignite on the first attempt. This is because the gas supply piping is filled with air, so it may take a few minutes for this air to be purged from the lines.

      2) The dryer is equipped with a Hot Surface Ignition (HSI) system which has internal diagnostics. If ignition is not established after three (3) attempts, the heat circuit HSI module will LOCK-OUT until it is manually reset. To reset the HSI system, open and close the main door and restart the dryer (press the "ENTER/START" key).

NOTE: During the purging period, check to be sure that **ALL** gas shut-off valves are open.

      3) Once ignition is established, a gas pressure test **should be** taken at the gas valve pressure tap of each dryer to assure that the water column (W.C.) pressure is correct and consistent.

NOTE: Water column pressure requirements (measured at the gas valve pressure tap)...

Natural Gas --------- 3.5 - 4.0 Inches W.C.
L.P. Gas ---------- 10.5 - 11.0 Inches W.C.

IMPORTANT: There is no regulator provided in an L.P. dryer. The water column (W.C.) pressure ***must be*** regulated at the source (L.P. tank) or an external regulator ***must be*** added to each dryer.

b. Steam Models

1) Check to insure that the steam damper is functioning properly.

a) The steam damper **should not** "slam" (open or closed) when it reaches the end of (piston) travel. Additionally, the steam damper **should not** bind and/or stop during travel. If either of these conditions occur, the flow control **must be** adjusted. Refer to the **bottom illustration** on **page 32** for air adjustment instructions.

6. Make a complete operational check of **ALL** safety-related circuits (i.e., lint drawer switch, and sail switch on gas models).

NOTE: To check for proper sail switch operation , open the main door and while holding main door switch plunger in, start the dryer. The dryer should start but the heat circuit ***should not*** be activated (on). If the heat (burner) does activate, shut the dryer off and make the necessary adjustments.

7. A reversing basket (tumbler) dryer ***should never*** be operated with less than a 100 lb. load (dry weight). The size of the load will affect the coast-down and dwell (stop) times. The basket (tumbler) *must come to a complete stop* before starting in the opposite direction.

a. Microprocessor (computer) Dryer Models

1) Spin and stop ***are not adjustable*** in the Automatic Mode and have been preprogrammed into the microprocessor controller (computer) for 150-seconds spin time in the forward direction and 120-seconds in the reverse direction with a 5-second dwell (stop) time.

2) Spin and stop times ***are adjustable*** in the Manual (timed) Mode.

b. Dual Timer Dryer Models

1) Both spin time and stop (dwell) time ***are adjustable*** (refer to **page 45**).

IMPORTANT: The dryer basket (tumbler) is treated with a protective coating. **ADC** suggests tumbling old clothes or material in the basket (tumbler), using a mild detergent to remove the protective coating.

8. Each dryer **should be** operated through one (1) complete cycle to assure that no further adjustments are necessary and that **ALL** components are functioning properly.

9. Make a complete operational check of **ALL** operating controls.

   a. Microprocessor controller (computer) programs/selections...

      1) Each microprocessor controller (computer) has be preprogrammed by the factory with the most commonly used parameter (program) selections. If computer changes are required, refer to the computer programming manual which was shipped with the dryer.

   b. Dual Timer check...

      1) Heating Timer
      2) Cool Down Timer
      3) Temperature Selection Switch

K. COMPRESSED AIR REQUIREMENTS

The model M-170 dryer requires an external supply of compressed air (2.5 cfm @ 80 PSI for gas models and 6 cfm @ 80 PSI for steam models). For Steam Models, compressed air is necessary for the air operated steam damper. On both the Steam Model as well as the Gas Models, compressed air is necessary/ required for blower air jet operation...to clean lint from the impellor/fan (squirrel cage).

1. Air Requirements

   a. Microprocessor (computer) dryers...

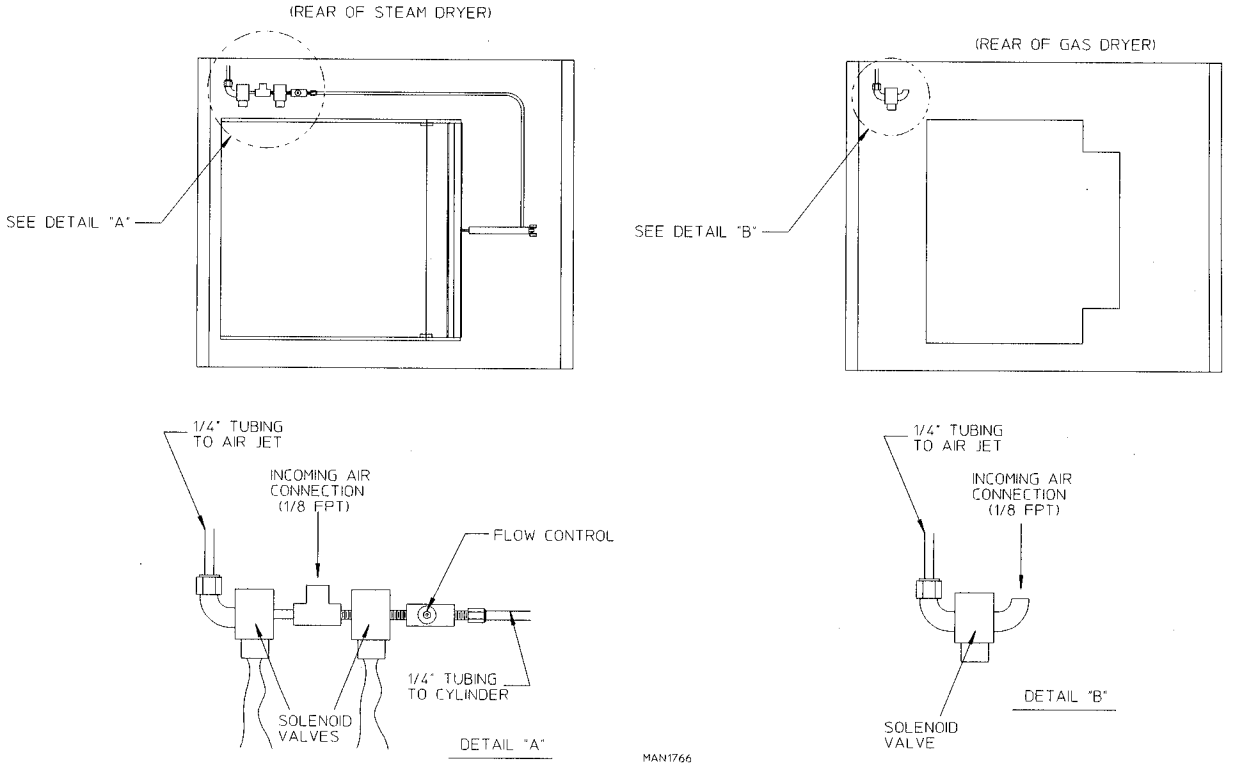
Compressed Air Supply	Air Pressure
Normal	80 PSI
Minimum Supply	70 PSI
Maximum Supply	90 PSI

2. Air Regulation

   a. No air regulation or air filtration is provided with the dryer. *External regulation/filtration of 80 PSI* ***must be*** *provided.* It is suggested that a regulator/filter gauge arrangement be added to the compressed air line just before the dryer connection. This is necessary to insure that correct and clean air pressure is achieved.

3. Air Connection

   a. Air connection to this system is a 1/8" F.P.T. (female pipe thread) as per the illustration below.



L. SHUT DOWN INSTRUCTIONS

If the dryer is to be shut down (taken out of service) for a period of time, the following **MUST BE** performed;

1. Discontinue power to the dryer either at the external disconnect switch or the circuit breaker.

2. Discontinue the heat supply:

   a. ***GAS MODELS*** ... discontinue the gas supply.

      1) **SHUT OFF external gas supply shut-off valve.**

      2) **SHUT OFF internal gas supply shut-off valve located in the gas valve burner area.**

   a. ***STEAM MODELS*** ... discontinue the steam supply.

      1) **SHUT OFF external (location furnished) shut-off valve.**

      2) **SHUT OFF internal steam valves in the supply lines and the return lines.**

SECTION IV

SERVICE/PARTS INFORMATION

A. SERVICE

1. Service **must be** performed by a qualified trained technician, service agency, or gas supplier. If service is required, contact the distributor from whom the **ADC** equipment was purchased. If the distributor cannot be contacted or is unknown, contact the **ADC** Service Department for a distributor in your area.

NOTE: When contacting the **ADC** Service Department, be sure to give them the correct **model number** and **serial number** so that your inquiry is handled in an expeditious manner.

B. PARTS

1. Replacement parts **should be** purchased from the distributor from whom the **ADC** equipment was purchased. If the distributor cannot be contacted or is unknown, contact the **ADC** Parts Department for a distributor in your area. Parts may also be purchased directly from the factory by calling the **ADC** Parts Department at (508) 678-9010 or you may FAX in your order at (508) 678-9447.

NOTE: When ordering replacement parts from the **ADC** dealer or the **ADC** factory be sure to give them the correct **model number** and **serial number** so that your parts order can be processed in an expeditious manner.

SECTION V

WARRANTY INFORMATION

A. RETURNING WARRANTY CARD(S)

1. Before any dryer leaves the **ADC** factory test area, a warranty card (**ADC** Part No. 112254) is placed on the back side of the main door glass. These warranty cards are intended to serve the customer where we record the individual installation date and warranty information to better serve you should you file a warranty claim.

   a. If a warranty card (**ADC** Part No. 112254) did not come with your dryer, contact the **ADC** Warranty Department or **ADC** Service Department at (508) 678-9000.

B. PARTS

For a copy of the **ADC** commercial warranty covering your particular dryer(s), contact the **ADC** distributor from whom you purchased the equipment and request dryer warranty form **ADC** Part No. 450199. If the distributor cannot be contacted or is unknown, warranty information can be obtained from the factory by contacting the **ADC** Warranty Department at (508) 678-9000.

> **NOTE:** Whenever contacting the **ADC** factory for warranty for warranty information, be sure to have the dryer's **model number** and **serial number** available so that your inquiry can be handled in an expeditious manner.

C. RETURNING WARRANTY PARTS

ALL dryer or parts warranty claims or inquires **should be** addressed to the **ADC** Warranty Parts Department. To expedite processing, the following procedures **must be** followed:

1. No parts are to be returned to **ADC** without prior written authorization ("Return Material Authorization") from the factory.

> **NOTE:** An R.M.A. ("Return Material Authorization") is valid for only sixty (60) days from date of issue.

   a. The R.M.A. issued by the factory, as well as any other correspondence pertaining to the returned part(s), **must be** included inside the package with the failed merchandise.

2. Each part **must be** tagged with the following information:

   a. **Model number** and **serial number** of the dryer from which part was removed.

   b. Nature of failure (be specific).

c. Date of dryer installation.

d. Date of part failure.

e. Specify whether the part(s) being returned is for a replacement, a credit, or a refund.

NOTE: If a part is marked for a credit or a refund, the invoice number covering the purchase of the replacement part ***must be*** provided.

NOTE: Warranty tags (**ADC** Part No. 450064) are available at "no charge" from **ADC** upon request.

3. The company returning the part(s) must clearly note the complete company name and address on the outside of the package.

4. **ALL** returns **must be** properly packaged to insure that they are not damaged in transit. *Damage claims are the responsibility of the shipper.*

IMPORTANT: No replacements, credits or refunds will be issued for merchandise damaged in transit.

5. **ALL** returns **should be** shipped to the **ADC** factory in such a manner that they are insured and a proof of delivery can be obtained by the sender.

6. **Shipping charges are not the responsibility of ADC. ALL returns *should be* "prepaid" to the factory. Any "C.O.D. or "COLLECT" returns will not be accepted.**

IMPORTANT: No replacements, credits, or refunds will be issued if the claim **cannot** be processed due to insufficient information. The party filing the claim will be notified in writing, either by "FAX" or "CERTIFIED MAIL - Return Receipt Requested," as to the information necessary to process claim. If reply *is not* received by the **ADC** Warranty Department within thirty (30) days from the FAX/letter date, then no replacement, credit, or refund will be issued, and the merchandise **will be** discarded.

SECTION V

ROUTINE MAINTENANCE

A. CLEANING

A program and/or schedule **should be** established for periodic inspection, cleaning, and removal of lint from various areas of the dryer, as well as throughout the duct work system. The frequency of cleaning can best be determined from experience at each location. Maximum operating efficiency is dependent upon proper air circulation. The accumulation of lint can restrict this air flow. If the guidelines in this section are met, an **ADC** dryer will provide may years of efficient, trouble-free, and - most importantly - safe operation.

WARNING: LINT FROM MOST FABRICS IS HIGHLY COMBUSTIBLE. THE ACCUMULATION OF LINT CAN CREATE A POTENTIAL FIRE HAZARD.

WARNING: KEEP DRYER AREA CLEAR AND FREE FROM COMBUSTIBLE MATERIALS, GASOLINE, and OTHER FLAMMABLE VAPORS and LIQUIDS.

NOTE: REMOVE POWER FROM THE MACHINE BEFORE PERFORMING ANY MAINTENANCE IN THE MACHINE (cleaning the lint drawers and both steam coil lint screens are the only exceptions).

NOTE: Suggested time intervals shown are for average usage which is considered six (6) to eight (8) operational (running) hours per day.

CLEAN LINT FROM LINT DRAWER/SCREEN EVERY THIRD or FOURTH LOAD.

NOTE: The frequency of cleaning the lint screens can best be determined from experience at each location.

WEEKLY

Clean lint accumulation from the lint chamber, thermostat, and microprocessor temperature sensor (sensor bracket) area.

WARNING: TO AVOID HAZARD OF ELECTRICAL SHOCK, DISCONTINUE ELECTRICAL POWER SUPPLY TO THE DRYER.

STEAM DRYERS

Clean the steam coil fins. Suggest using compressed air and a vacuum cleaner with brush attachment.

NOTE: ***When cleaning steam coil fins, be careful not to bend the fins.*** If fins are bent, straighten by using a ***fin comb***, which is available from any local air conditioning supply house.

90 DAYS

Remove lint from around basket (tumbler), drive motors, and surrounding areas. Remove lint from the gas valve burner area with a dusting brush or vacuum clearer attachment.

Re-grease the two (2) 1-3/8" bearings that support the impellor/fan shaft. Use Shell Avania #3 grease or its equivalent. Impellor (fan/blower) shaft bearings **should be** lubricated using a #3 grease or its equivalent.

Check to make sure that the set screws on the impellor/fan shaft bearings are tight.

Remove lint from around basket (tumbler), drive motors, and surrounding areas. Remove lint from gas valve burner area with a dusting brush or vacuum cleaner attachment.

NOTE: To prevent damage, avoid cleaning and/or touching the Hot Surface Ignitor.

Remove lint accumulation from inside

6 MONTHS

Inspect and remove lint accumulation in customer furnished exhaust duct work system and from dryers internal exhaust ducting.

NOTE: THE ACCUMULATION OF LINT IN THE EXHAUST DUCT WORK CAN CREATE A POTENTIAL FIRE HAZARD.

NOTE: ***DO NOT*** OBSTRUCT THE FLOW OF COMBUSTION and VENTILATION AIR. CHECK CUSTOMER FURNISHED BACK DRAFT DAMPERS IN THE EXHAUST DUCT WORK. INSPECT and REMOVE ANY LINT ACCUMULATION WHICH CAN CAUSE THE DAMPER TO BIND or STICK.

NOTE: A back draft damper that is sticking partially closed can result in slow drying and shut-down of the heat circuit safety switches or thermostats.

NOTE: When cleaning the dryer cabinet(s), avoid using harsh abrasives. A product Intended for the cleaning of appliances is recommended.

Check <u>ALL</u> V-Belts for tightness and wear. Retighten, realign, or replace if required.

NOTE: V-Belts ***should be*** replace in matched sets (pairs).

B. ADJUSTMENTS

7 DAYS AFTER INSTALLATION and EVERY 6 MONTHS THEREAFTER

Inspect bolts, nuts, screws, (bearing set screws), nonpermanent gas connections (i.e., unions, shut-off valves, orifices), and grounding connections. Fan (impellor) V-belts, along with the motor and drive belts **should be** examined and replaced if necessary. Tighten loose V-belts when necessary. Complete operational check of controls and valves. Complete operational check of **ALL** safety devices (i.e., door switches, lint drawer switch, sail switch, burner and hi-limit thermostats).

M-170 ONLY: *Squirrel cage type fan (impellor) on the blower motor* ***must be*** *inspected and cleaned every six (6) months.*

C. LUBRICATION

The motor bearings, the idler bearings, and the tumbler bearings are ***permanently lubricated.*** **NO LUBRICATION IS NECESSARY.**

90 DAYS

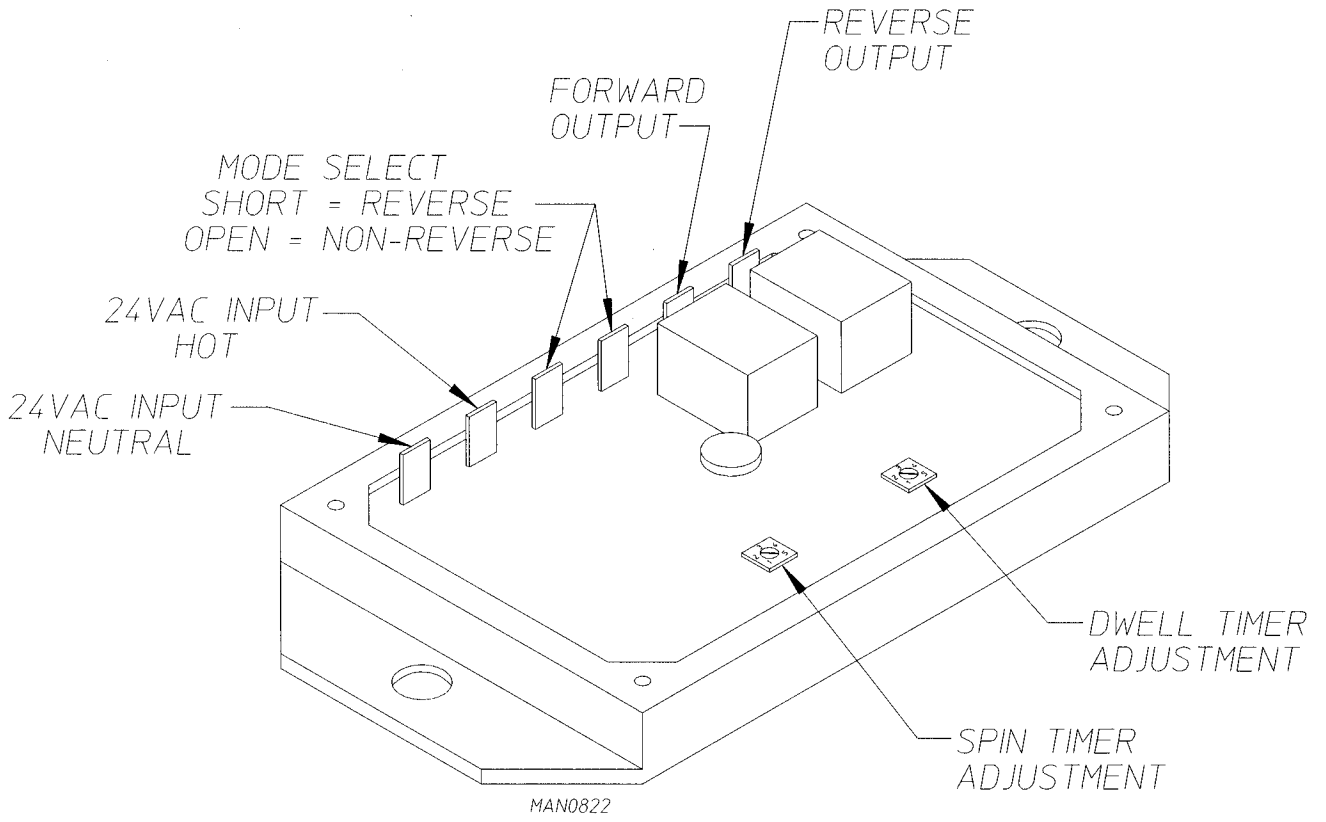
Re-grease the two (2) 1-3/8" bearings that support the impellor/fan shaft. Use Shell Avania #3 grease or its equivalent. Impellor (fan/blower) shaft bearings **should be** lubricated using a #3 grease or its equivalent.

SECTION VII

REVERSING TIMER SPIN/DWELL ADJUSTMENTS

Timer models have an electronic reversing timer in the electrical service box which is located in the upper left rear area of the dryer.

Both the Dwell (stop) Time and the basket (tumbler) Spin Time are adjustable by mode selection switches located on the electronic timer (as noted in the illustration below).

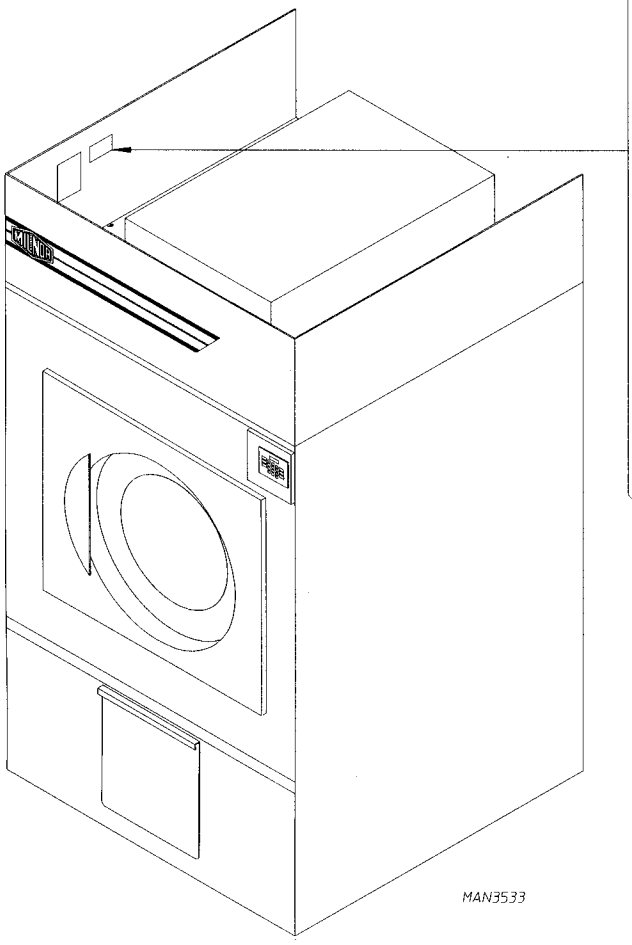


TIMING LEGEND					
SPIN TIME					
Switch Postion Number	1	2	3	4	5
Time in Seconds*	30	60	90	120	150
DWELL (Stop) TIME					
Switch Postion Number	1	2	3	4	5
Time in Seconds*	5	6	8	10	12
* Values shown are +/- 1 second.					

SECTION VIII

DATA LABEL LOCATION/INFORMATION

DATA LABEL



MODEL	**SERIAL NO.**
MLG170HS	396194

MANUFACTURING CODE NUMBER
3600205130134080136D50000000000000

TYPE OF HEAT	**HEAT INPUT**
GAS/NATURAL	550,000 BTUH

ELECTRIC SERVICE
208V/60HZ/3PH/3W 26A

GAS MANIFOLD PRESSURE
3.5 IN WC

FOR USE WITH NATURAL AND L.P. GASES "NRTL"
ANS Z21.5.2 b-1992 CLOTHES DRYER VOL II

APPROVED BY THE BOARD OF STANDARDS AND APPEALS FOR USE IN NEW YORK CITY, MEA 91-83-E, MEA 92-83-E, MEA 306-87. APPROVED BY THE DEPT. OF BUILDING & SAFETY FOR USE IN THE CITY OF L.A. #265700 & #310099.

24 VOLT
CONTROL
VOLTAGE

P/N 112060

When contacting **American Dryer Corporation**, certain information is required to insure proper service/parts information from **ADC**. This information is on the data label that is located in the left inside front side panel (as shown in the illustration above). When contacting **ADC** please have the **model number** as well as the **serial number** readily available.

THE DATA LABEL

1. **MODEL DRYER**
   The model number is an **ADC** number which describes the size of the dryer and the type of heat (gas, electric, or steam).

2. **SERIAL NUMBER**
   The serial number allows **ADC** to gather information on your particular dryer.

3. **MANUFACTURING CODE NUMBER**
   The manufacturing code number is a number issued by **ADC** which describes **ALL** possible options on your particular model.

4. **TYPE OF HEAT**
   The type of heat describes the type heat for your particular dryer; gas (either natural gas or liquid propane [L.P.]), or steam.

5. **HEAT INPUT** (for GAS DRYERS)
   This describes the heat input in British Thermal Units per Hour (BTUH).

6. **ELECTRIC SERVICE**
   This describes the electric service for your particular model.

7. **GAS MANIFOLD PRESSURE** (for GAS DRYERS)
   This describes the manifold pressure taken at the gas valve tap.

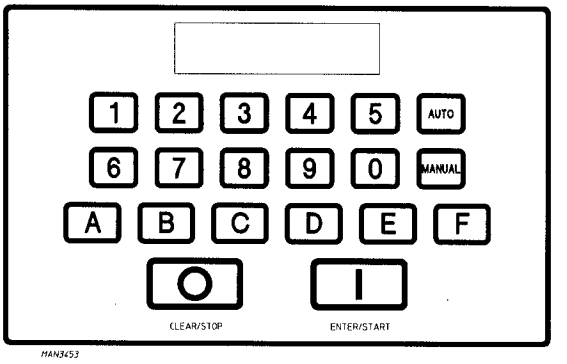
SECTION IX

PROCEDURE FOR FUNCTIONAL CHECK OF REPLACEMENT COMPONENTS

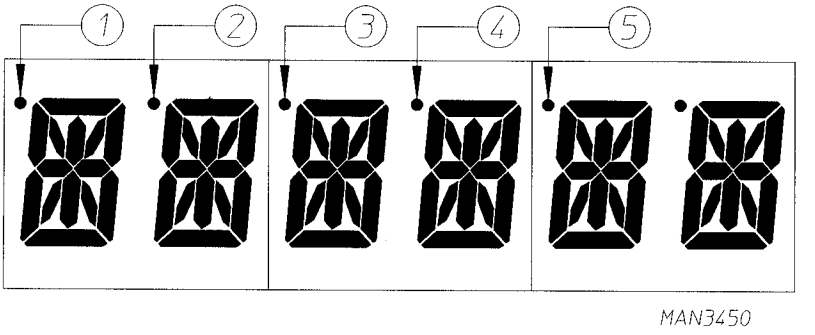
1. Microprocessor (computer) Board

   a. Upon completing installation of the replacement microprocessor (computer) board, reestablish power to the dryer.

   b. Start the drying cycle by pressing any of the preset cycles in letters A-F.

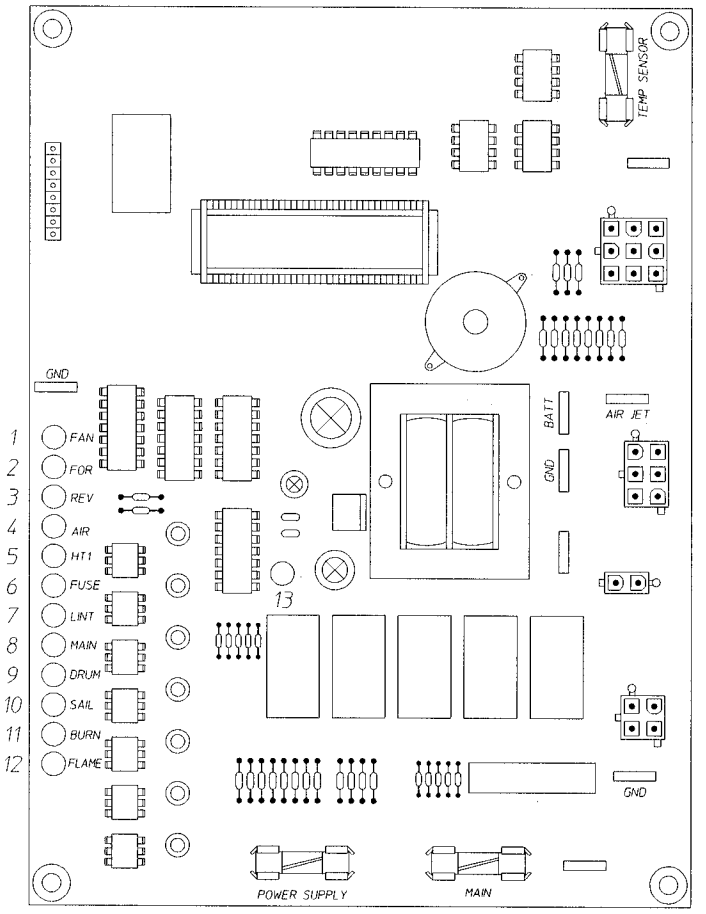


   c. Verify that the motor(s) and the heat indicator dots, in the microprocessor (computer) L.E.D. (liquid emitting diode) display are on. (Refer to the illustration below.)



   1) Basket (tumbler) in Forward Mode (clockwise) indicator
   2) Basket (tumbler) in Reverse Mode (counterclockwise) indicator
   3) Heat on indicator
   4) On indicator (dryer is in Operation Mode)
   5) Air Jet indicator

d. Verify that the motor(s) heat, and door indicator lights on the back side of the microprocessor (computer) board are lit. (Refer to the illustration below.)



MAN3449

1) "FAN" (Blower) L.E.D. indicator
2) "FOR" (Forward) output L.E.D. indicator
3) "Rev" (Reverse) output L.E.D. indicator
4) "Air" (Air Jet) output L.E.D. indicator
5) "HT 1" (Heat) output L.E.D. indicator
6) "Fuse" (Main Fuse) input L.E.D. indicator
7) "Lint" (Lint Door) input L.E.D. indicator
8) "Main" (Main Door) input L.E.D. indicator
9) "Drum" (Tumbler Hi-Limit) input L.E.D. indicator
10) "Sail" (Sail Switch) input L.E.D. indicator
11) "Burn" (Burner Hi-Limit) input L.E.D. indicator
12) "Flame" (Burner Control Failure) input L.E.D. indicator
13) "Power Supply"

e. Open main door. The dryer ***must stop*** and **ALL** indicator lights on the back side of the microprocessor (computer) board ***must go out***. (Refer to **illustration** on previous page [**page 49**].)

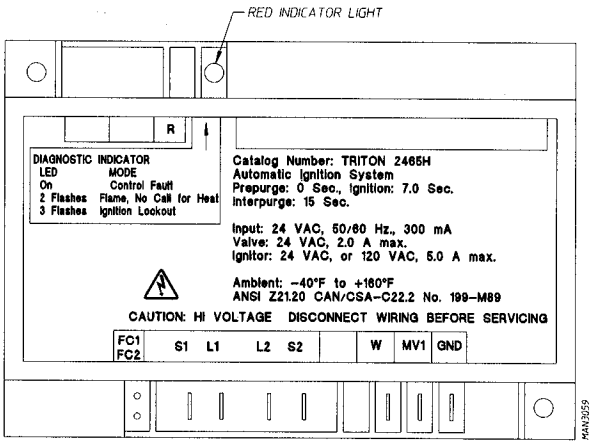
f. Try to restart the dryer with the main door open.

g. The microprocessor (computer) board's L.E.D. display ***must read*** "**MAIN dOOR.**"

h. Close the main door and restart the dryer.

i. Functional check of microprocessor (computer) board is complete.

2. Hot Surface Ignition (HSI) System



a. Upon completing installation of the replacement Hot Surface Ignition (HSI) module, reestablish power to the dryer.

b. The HSI module's "red" indicator light will light for up to approximately 5 seconds (self check routine).

   If the HSI module's "red" indicator light stays on or flashes continuously, then the HSI module is wired incorrectly or has failed.

c. Start the drying cycle.

d. The hot surface ignitor will turn on, and a few seconds later the gas valve will be energized. After approximately 4 seconds the hot surface ignitor will shut off. ***Ignition (flame) should now be established.***

e. With the burner flame on, remove the flame sensor wire from the S2 terminal of the HSI module. ***The burner flame must shut off immediately.***

f. Stop the drying cycle, with the flame sensor wire still removed, restart the drying cycle.

g. The hot surface ignitor will turn on, and after a few seconds later the gas valve will be energized and the hot surface ignitor will shut off. Ignition (flame) **should be** evident for approximately 7 seconds and then shut off.

h. The HSI module will attempt two (2) additional ignition trials after which the HSI module will lock out and the "red" indicator light ***will flash continuously.***

i. Functional check of the Hot Surface Ignition (HSI) Module is complete.

   1) Replace the flame sensor wire from the S2 terminal to the HSI module.

ADC 113003 **1-** 08/22/97-50 **2*** 05/05/98-50 **3*** 11/24/98-50
4* 06/24/99-25 **5-** 09/01/99-25 **6*** 11/19/99-35
7- 03/02/00-25 **8-** 06/22/00-50 **9-** 10/19/01-50

American Dryer Corp.